DAMES & MOORE

A DAMES & MOORE GROUP COMPANY

Final Report
Dissolved Phase Investigation
Backyards Area
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

Job Number 16000-533-7106-037
August 15, 1997

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August 15, 1997

Chevron Products Company
Refining Department
575 Market Street, 27th Floor
San Francisco, California 94105

Attn: Ms. Patricia Wagner
Senior Environmental Specialist

Re: Final Report
Dissolved Phase Investigation - Backyards Area
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii
Job Number 16000-533-7106-037

Dear Ms. Wagner:

Dames & Moore is pleased to provide Chevron Products Company (Chevron) with three copies of the Final Report summarizing the results of our investigation of dissolved phase groundwater constituents in the Backyards Area of the Chevron Hawaii Refinery in Kapolei, Oahu, Hawaii.

We trust that this report provides the information needed at this time. If your have any questions, please call.

Sincerely,

DAMES & MOORE

Edward W. Tschupp, P. E.
Senior Hydrogeologist

Mary J. Esper, P.E.
Project Manager

EWT/MJE/agp

(97HON-464\464txt.wpd:16000-533-7106-037)

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LIST OF ACRONYMS AND ABBREVIATIONS
CHEVRON HAWAII REFINERY
Kapolei, Oahu, Hawaii

bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylene
COPC	chemical of potential concern
COPHC	chemical of potential human concern
CRTC	Chevron Research and Technology Corporation
CSM	conceptual site model
EPA	United States Environmental Protection Agency
GC/FID	gas chromatogram with flame ionization detector
HH	human health
HDOH	Hawaii Department of Health
kg	kilogram
LNAPL	light non-aqueous phase liquid
LSFO	low sulfer fuel oil
mg/kg	milligram per kilogram
mg/L	milligram per liter
MSL	mean sea level
NA	not analyzed
ND	not detected
PAHs	polynuclear aromatic hydrocarbons
PID	photoionization detector
PQL	practical quantitation limit
ppm	parts per million
PVC	polyvinylchloride
RBCA	risk-based corrective action
RBSLs	risk-based screening levels
PRG	preliminary remediation goal
RAMR	Risk Assessment Methodology Report
SVOC	semi-volatile organic compound
VOC	volatile organic compound

EXECUTIVE SUMMARY

ES-1 INTRODUCTION

This report presents a summary of a dissolved phase groundwater investigation conducted in the "Backyards Area" of the Chevron Hawaii Refinery (Refinery) located in Kapolei, Oahu, Hawaii. During June 1996, Dames & Moore performed groundwater sampling of selected wells in the Backyards Area. The groundwater samples were analyzed for organic and inorganic dissolved phase constituents. Following completion of the laboratory analyses, the data were used for evaluation of potential human and ecological risks in the Backyards Area.

The objectives of the dissolved phase investigation were as follows:

- Assessment of the lateral distribution of dissolved constituents in the Backyards Area associated with light non-aqueous phase liquids (LNAPL) or other Refinery sources;
- Collection of data to evaluate the attenuation and biodegradation relationships for Backyards Area dissolved constituents;
- Collection of data for Tier 1 and Tier 2 Risk Assessment; and
- Assessment of locations and parameters appropriate for a dissolved phase monitoring program.

The nature and lateral extent of constituents dissolved in groundwater in the Backyards Area have not previously been evaluated. This evaluation of the potential presence of dissolved phase constituents was performed by groundwater sampling and analysis from existing wells located in the Backyards Area.

ES-2 FIELD INVESTIGATION AND RESULTS

Existing wells located along three profiles were selected oriented along groundwater flowlines downgradient of the LNAPL plume in the Backyards Area. In addition, a cross-gradient well location and an upgradient well located at the east side of the Refinery were selected as "background" wells. In addition, data from offsite groundwater sampling and analysis provided

additional background water quality data. Several additional wells in the Backyards Area were added as sampling locations for this investigation, based on the locations of the RFI facilities.

Chemical analysis were focused on dissolved phase constituents of concern associated with petroleum hydrocarbons and the degradation of hydrocarbons in the environment (intrinsic biodegradation), and selected wells were analyzed for additional chlorinated organic compounds. These analyses were performed to provide a "baseline" evaluation of groundwater conditions and to evaluate for the presence of a wide range of compounds that may be present from various sources.

The groundwater samples were analyzed for the following:

- Volatile organic compounds (VOCs) using United States Environmental Protection Agency (EPA) Method 8260;
- Semi-volatile organic compounds (SVOCs) using EPA Method 8270;
- Polynuclear aromatic hydrocarbons (PAHs) were analyzed by EPA Method 8270 with selected ion monitoring (SIM);
- Select metals (arsenic, cadmium, lead, mercury, nickel, and vanadium) using EPA Method 6000/7000; and
- Intrinsic biodegradation parameters.

LNAPL was found in three of the wells sampled (wells D6-R34, D7-15 and D7-33). Well D6-R34 is inside of the Backyards LNAPL plume area. The presence of the LNAPL at wells D7-15 and D7-33 indicates a small localized area with a thin accumulation of LNAPL floating on the groundwater table. The LNAPL in this area appears to be separated from other Refinery Backyards Area LNAPL to the north.

The primary organic constituents observed in the dissolved phase data are benzene, toluene, ethylbenzene, and xylenes (BTEX) and PAH compounds. BTEX and PAH compounds were not detected in either the upgradient or cross gradient background wells. No other VOCs and SVOCs have been detected at any of the wells included in this investigation at concentrations in excess of laboratory practical quantitation limits (PQLs), except for bis (2 ethylhexyl) phthalate, a commonly observed laboratory cross-contaminant. The organic compound data do not indicate the presence of constituents unrelated to LNAPL (such as chlorinated solvents).

Intrinsic biodegradation monitoring parameters reveal trends indicative of on-going in-situ biodegradation of dissolved constinuents from the LNAPL. The trends are most apparent in the sulfate, dissolved oxygen and oxidation reduction potential data, all of which increase in concentration with distance downgradient from the LNAPL. The trends are also most evident when the Backyards Area well data are compared to data from off-site wells, and the trends are more clearly apparent in the data from the north and central profiles. The south profile data are believed to be influenced by the localized presence of LNAPL in the D7-15 and D7-33 area. The pH and nitrogen data suggest a similar, less well defined trend.

Superimposed on the inorganic data is the trend of increased salinity with proximity to the ocean. The salinity trend is clearly evident in the TDS and chloride data.

ES-3 RISK ASSESSMENT SUMMARY

Under current conditions, none of the dissolved phase groundwater chemicals of potential concern (COPCs) except arsenic and mercury were found in sufficient concentration in the wells located nearest to the Pacific Ocean to pose a potential human health threat to recreational users of the ocean. Arsenic and mercury levels exceeded their respective risk-based screening levels (RBSLs) that were derived from Ambient Water Quality Criteria (AWQC) based on fish consumption. However, the arsenic and mercury levels were considered within range of naturally occurring levels in seawater; high salinity is present at the wells near the ocean.

Monitoring data and visual observations indicate the LNAPL has not migrated to the Pacific Ocean. LNAPL migration to the ocean in the future is unlikely due to the flat groundwater gradient, high residual water saturation of the vadose zone due to tidal fluctuations, and monitoring observations that the plume is stable.

Current and future on-site workers could potentially be exposed to volatile chemicals released from the LNAPL into indoor air. These exposures will be addressed in a separate report which evaluates an industrial worker scenario using a worst-case indoor air scenario for buildings at the Refinery. There are no identified ecological health threats from the hydrocarbon plume.

The following summarizes the results of this refined CSM:

Receptor	Type of COPCs	Pathway	Risk	Action
Current Conditions				
On-site Indoor Worker	**Groundwater-** Semivolatile, Nonvolatile **LNAPL** -Volatile, Semivolatile, Nonvolatile **Soil** -Volatile, Semivolatile, Nonvolatile	Inhalation	Potential exposure to chemicals in groundwater and LNAPL	Tier II On-site Industrial Worker Risk Assessment (In Progress)
Off-site Worker		Inhalation	Insignificant exposure	None
Recreational User		Dermal, Ingestion	Insignificant exposure	None
Organisms in Ocean; Pelagic Birds and Shorebirds		Uptake	Insignificant exposure	None
Terrestrial Birds and Mammals		Inhalation	Insignificant exposure	None
Future Conditions				
On-site Indoor Worker	**Groundwater-** Semivolatile, Nonvolatile **LNAPL** -Volatile, Semivolatile, Nonvolatile **Soil** -Volatile, Semivolatile, Nonvolatile	Inhalation	Potential exposure to chemicals in groundwater and LNAPL	Tier II On-site Industrial Worker Risk Assessment (In Progress)
Off-site Worker		Inhalation	Insignificant exposure	None
Construction Worker		Inhalation, Dermal, Ingestion	Potential exposure to chemicals in groundwater and LNAPL	Institutional Controls
Recreational User		Dermal Ingestion	Potentially significant exposure; contingent upon plume migration	Plume Stability Evaluation Program
Organisms in Ocean; Pelagic Birds and Shorebirds		Uptake	Potentially significant exposure; contingent upon plume migration	Plume Stability Evaluation Program
Terrestrial Birds and Mammals		Inhalation	Potentially significant exposure; contingent upon plume migration	Plume Stability Evaluation Program

ES-4 RECOMMENDATIONS

The data from this investigation were developed by sampling and analysis of 19 wells in the Backyards Area during June 1996. The data from the June 1996 provide a baseline set of data for comparison with future sampling events. Based on the data from this investigation, a reduced number of wells and monitoring parameters would be effective for future monitoring. The additional monitoring recommendations have been implemented through the Plume Wide Groundwater Monitoring Program submitted to EPA and the State of Hawaii Department of Health.

1.0 INTRODUCTION

This report presents a summary of a dissolved phase groundwater investigation conducted in the "Backyards Area" of the Chevron Hawaii Refinery (Refinery) located in Kapolei, Oahu, Hawaii (Figure 1). The dissolved phase assessment was conducted in accordance with our June 4, 1996 Workplan, and as reviewed and approved by the United States Environmental Protection Agency (EPA). During June 1996, Dames & Moore performed groundwater sampling of selected wells in the Backyards Area. The groundwater samples were analyzed for organic and inorganic dissolved phase constituents. Following completion of the laboratory analyses, the data were used for evaluation of potential human and ecological risks in the Backyards Area.

The objectives of the dissolved phase investigation were as follows:

- Assessment of the lateral distribution of dissolved constituents in the Backyards Area associated with light non-aqueous phase liquids (LNAPL) or other Refinery sources;

- Collection of data to evaluate the attenuation and biodegradation relationships for Backyards Area dissolved constituents;

- Collection of data for Tier 1 and Tier 2 Risk Assessment; and

- Assessment of locations and parameters appropriate for a dissolved phase monitoring program.

The Backyards Area dissolved phase investigation is one component of the Refinery-Wide Site Assessment investigations conducted by Chevron to evaluate the nature and extent of environmental impacts associated with a subsurface LNAPL plume present on top of groundwater beneath the Refinery. Previously, the distribution of LNAPL in the Backyards Area and at the perimeter of the Refinery was delineated (Dames & Moore, 1995a, 1996a), and the groundwater flow direction and gradient conditions within the uppermost aquifer beneath the Refinery were evaluated (Dames & Moore, 1995b).

The nature and lateral extent of constituents dissolved in groundwater in the Backyards Area have not previously been evaluated. This evaluation of the potential presence of dissolved phase constituents was performed by groundwater sampling and analysis from existing wells located in the Backyards Area. To evaluate spacial distribution of dissolved constituents, including attenuation

of potential constituents of concern, three profiles of wells were selected oriented along groundwater flowlines downgradient of the LNAPL plume in the Backyards Area. In addition to the profile wells, several additional existing monitoring wells were added to the sampling program to further characterize existing groundwater conditions in the Backyards Area. Finally, cross-gradient and upgradient wells were sampled for "background" dissolved constituent data.

2.0 SITE DESCRIPTION AND BACKGROUND

2.1 PHYSICAL SETTING

The Refinery is situated on approximately 248 acres located within the Campbell Industrial Park on the Ewa Plain, Oahu, Hawaii. Land use in the area is either industrial or undeveloped, and zoned for industrial or agricultural development. The Pacific Ocean borders the Refinery to the west. To the north is Malakole Street and a relatively undeveloped parcel located between the Refinery and the Barber's Point Harbor. The area to the east of the Refinery includes several industrial or commercial warehouse structures, and some undeveloped land along Hanua Street. The area to the south of the Refinery is occupied by a petroleum storage tankfarm owned by the Hawaiian Electric Company (HECO), vacant land and an industrial facility owned by Brewer Industries. The Backyards Area of the Refinery is situated between the Pacific Ocean and the main processing facilities of the Refinery (Figure 2). The Refinery was constructed in the late 1950's, and was one of the earliest tenants in the Campbell Industrial Park. Prior to construction of the Refinery, the property in the area was largely undeveloped.

The topography in the vicinity of the Refinery is nearly flat, with relatively little relief or development of surface water drainage features. Ground surface elevations at the Refinery range from approximately 5 to 15 feet above mean sea level (MSL). The Refinery is situated on an emerged coral reef complex in which numerous surface and subsurface voids have developed, described as a karst topography. Due to the numerous voids and karst features, thin soil development, relatively low rainfall (less than 20 inches of precipitation per year on average), and limited surface water drainage, much of the precipitation infiltrates to the water table, and runoff is limited.

2.2 SITE HISTORY AND FEATURES

The development of the Refinery has involved construction of numerous above-ground petroleum storage tanks, associated piping, and several petroleum processing facilities. The petroleum storage tanks were initially single bottom structures. Over the history of the Refinery, various parts of the site have been used as materials storage or handling areas. Some of the activities historically performed at the Refinery have been identified as potential sources of impacts to soil or groundwater. A summary of the activities and historic facilities that have the potential for soil or groundwater impacts is included in the RCRA Facilities Assessment (RFA) (A.T. Kearney, 1986) and RCRA Facilities Investigation (RFI) (Engineering Sciences, Inc., 1993) reports. The RFI report has been accepted as complete by the EPA, and no further action associated with the RFI facilities is required. Figure 3 summaries the locations of Solid Waste Management Units (SWMUs) that have been identified at the Refinery during the RFA and RFI assessments. Many of the SWMUs are historic facilities that have been completely removed from the site.

2.3 GEOLOGIC SETTING

The Refinery area geologic setting consists of coastal plain deposits, including coral reef deposits, coralline debris, and alluvium that are built up on the flanks of the Waianae Volcano. The coastal plain sedimentary deposits, referred to as the "caprock" due the relatively low permeability of the lower sediment deposits, are approximately 600 feet thick in the vicinity of the Refinery. The low permeability (fine grained) alluvium and lagoonal deposits are interbedded with, and laterally grade into relatively highly permeable coral reef and coralline debris (sand and gravel) deposits.

Shallow subsurface geologic conditions in the vicinity of the Refinery have been documented in boring logs of hundreds of borings and monitoring wells completed since construction of the Refinery. The borings have consistently encountered various types of corals, ranging from highly permeable barrier reef deposits with large open voids to finer-grained lagoonal sand and mudstone without visible porosity. The lateral persistence of different coral lithologies is limited, and specific correlations of rock types has not been established. The majority of borings drilled in the vicinity of the Refinery have penetrated to a depth of not more than approximately 25 feet below ground surface (bgs). Based on regional data, a relatively permeable coralline limestone aquifer exists within the uppermost 150 feet of the caprock. A relatively low permeability sedimentary mudstone (aquitard) zone exists between 150 and 190 feet bgs, followed by additional discrete coral and

mudstone zones. The caprock therefore consists of multiple interbedded discrete aquifer and aquitard zones.

2.4 HYDROGEOLOGIC SETTING

Groundwater is found within the uppermost coralline aquifer at an elevation of approximately 0 to 3 feet above MSL, or a depth of from 5 to 15 feet bgs. Groundwater is also present in lower aquifer zones. The uppermost aquifer contains an uppermost lens of "fresh" groundwater, floating on top of the denser salt water present in the lower part of the aquifer. The fresh groundwater reflects regional recharge from infiltration of precipitation, runoff, and irrigation return flow. The thickness of the fresh water lens and the location of the fresh water - salt water interface is generally as described by the Ghyben-Herzberg relationship. In the vicinity of the Refinery, available water quality and salinity profile data indicate that the fresh groundwater lens is approximately 40 feet thick, and is considered to be brackish, based on total dissolved solids (TDS) concentrations.

Groundwater in the upper aquifer is tidally influenced throughout the entire Refinery area, and diurnal tidal groundwater level fluctuations have been observed at a distance of more than 3500 feet from the coastline. The tidal fluctuations result in highly variable groundwater gradient conditions. On average, the horizontal groundwater gradient is towards the ocean. Figure 4 shows average groundwater table elevation contours, measured over a 24-hour period of large diurnal tidal fluctuations. The average horizontal gradient in the region is relatively flat, estimated at approximately 0.0002. An upward vertical gradient has been demonstrated in monitoring well clusters at the Refinery.

Aquifer properties of the uppermost coralline aquifer include a relatively high hydraulic conductivity and effective porosity. Estimates of hydraulic conductivity are on the order of 1000 feet per day (ft/day), based on analysis of pump test and tidal data at the Refinery and elsewhere in the vicinity. An effective porosity (storage coefficient) of 0.1 has been reported in regional water resources studies; however, the average porosity appears to be greater than 0.1, possibly as high as 0.15 to 0.2, based on the abundant presence of the subsurface voids. Based on the average gradient, the estimated aquifer parameter values, and application of Darcy's Law, the average groundwater flow velocity is estimated to be in the range from 1 to 2 ft/day.

Groundwater in the uppermost aquifer is not used for domestic or irrigation purposes, due to high TDS concentrations. The groundwater beneath the Refinery is considered by the State of Hawaii,

Department of Health (HDOH) to be non-potable. Groundwater is used for industrial purposes at the Refinery and elsewhere within the Campbell Industrial Park. The groundwater extraction wells located at the Refinery Acid Plant and LPG facility produce on the order of 0.7 and 1.2 million gallons per day (MGD), respectively. The average groundwater contour lines and resultant groundwater vectors shown on Figure 4 indicate the presence of cones of depression associated with these wells. The actual drawdowns associated with these relatively high production rates appear to be minor, on the order of less than one foot. It is probable due to the high permeability of the coral that groundwater levels are maintained by the proximity of the ocean.

A LNAPL plume is present in the Backyards Area, and Chevron has conducted site assessment investigations to delineate the extent of LNAPL, established a plume stability evaluation program, and performed LNAPL recovery. No LNAPL migration has been observed, and based on ongoing monitoring and assessment data trends, recovery operations and source control measures conducted at the Refinery over the years, the LNAPL plume in the Backyards Area is believed to be stable. Plume stability is also enhanced by high relative saturation by water within the vadose zone that is maintained by the tidal fluctuations.

3.0 DISSOLVED PHASE SAMPLING METHODOLOGY

3.1 SELECTION OF SAMPLING LOCATIONS

To evaluate the nature and lateral extent of constituents dissolved in groundwater, a strategy was developed involving selection of existing wells located along three profiles oriented along groundwater flowlines downgradient of the LNAPL plume in the Backyards Area. Figure 5 shows the location of all wells in the Backyards Area, along with the locations of the profile wells and other wells selected for sampling and analysis as part of this investigation. The profile wells are oriented east to west as follows:

- North Profile (consisting of wells C4-76, B4-61, and A3-62);
- Central Profile (consisting of wells D6-R34, C6-R36, C6-R37, and C6-56); and
- South Profile (consisting of wells D7-34, D7-15, D7-33, and D7-51).

In addition, a cross-gradient well location (C2-64) and an upgradient well located at the east side of the Refinery (13-67) were selected as "background" wells. Subsequent to the June 1996 sampling of the Backyard Area wells, additional groundwater sampling and analysis was performed as part

of Off-Site Site Assessment Investigations (Dames & Moore, 1997a, 1997b, 1997c, 1997d), which have provided additional background water quality data.

Several additional wells were added as sampling locations for this investigation, based on the locations of the RFI facilities (Figure 3). Current or former facilities areas in the Backyards Area that may have the potential to have impacted groundwater include: the former LPG Area Cooling Water Pond; the former Waste Pile "C" Area; and the North and South Ocean Ponds; all located seaward of Makai Road. Other potential source areas in the Backyards Area include: the former Amine Wash Water Impoundment; the Neutralization Pond, Settling Basin and North Surge Pond (upgradient of the Oxidation Ponds); the Empty Drum Storage Area and MEK/Paint Pits located near the north end of the North Ocean Pond; Acid Neutralization Sumps near the Acid Plant; the API Separator; and the Clay Dewatering Basin near the Crude Distillation Unit.

The evaluation of proposed dissolved phase assessment wells relative to RFI facilities was completed to provide an understanding of potential "noise" that may complicate the assessment of dissolved phase impacts related to the LNAPL, and to allow for refinement of profile locations, modification of monitoring parameters, and addition of supplemental monitoring locations, if appropriate, to more completely evaluate potential dissolved phase impacts.

Based on the RFI facility locations, the following additional wells were included in the Backyards Area dissolved phase assessment, for the following reasons:

- Well C3-65, to compare to Well C4-76 to evaluate impacts that may be present from the former sewer sludge impoundment (RFI Unit 14);
- Well B5-R08, to evaluate impacts from Waste Pile C (RFI Unit 25) and/or Landfill A (RFI Unit 11);
- Well C6-58, to compare to Well C6-56 to evaluate impacts that may be present from the North Ocean Pond (RFI Unit 22);
- Well C6-R04, located near one of the MEK/Paint Pits (RFI Unit 37);
- Well D8-48, to compare to Well D7-51 to evaluate impacts that may be present from the North Ocean Pond;
- Well C7-54, located downgradient of the North Ocean Pond; and
- Well D8-50, located downgradient of the South Ocean Pond.

3.2 ANALYTICAL PROGRAM

Chemical analysis were focused on dissolved phase constituents of concern associated with petroleum hydrocarbons and the degradation of hydrocarbons in the environment (intrinsic biodegradation). Details of the analytical program were presented in the Workplan (Dames & Moore, 1996b) reviewed and approved by EPA, and are summarized on Table 1.

The groundwater collected from the upgradient well of each profile (wells C4-76, D6-R34, and D7-34), the background wells (C2-64 and I3-67), and most of the additional wells (C3-65, B5–R08, C6-R04, D8-48, C7-54, and D8-50) were analyzed for a more extensive list of parameters. These analyses were performed to provide a "baseline" evaluation of groundwater conditions and to evaluate for the presence of a wide range of compounds that may be present from various sources.

The groundwater samples from these wells were analyzed for the following:

- Volatile organic compounds (VOCs) using United States Environmental Protection Agency (EPA) Method 8260;
- Semi-volatile organic compounds (SVOCs) using EPA Method 8270;
- Polynuclear aromatic hydrocarbons (PAHs) were analyzed by EPA Method 8270 with selected ion monitoring (SIM);
- Select metals (arsenic, cadmium, lead, mercury, nickel, and vanadium) using EPA Method 6000/7000; and
- Intrinsic biodegradation parameters.

The groundwater collected from the remaining profile wells (B4-61, A3-62, C6-R36, C6-R37, C6-56, D7-15, D7-33, and D7-51) and one of the additional wells (C6-58) were analyzed for the following selected constituents:

- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA Method 8260;
- PAHs using EPA Method 8270 (SIM);
- Select metals (arsenic, cadmium, lead, mercury, nickel, and vanadium) using EPA Method 6000/7000; and
- Intrinsic biodegradation parameters.

All groundwater samples were submitted to the contract laboratory for intrinsic biodegradation parameter analyses, as identified in the Chevron Research and Technology Company (CRTC) March 1995 "Protocol for Monitoring Intrinsic Biodegradation in Groundwater." The analyses listed below reflect CRTC protocol testing methods including:

- Alkalinity using EPA Method 310.2 colorimetric;
- Nitrate using EPA Method 353.2 or SW-9200;
- Sulfate using EPA Method 375.4 or SW-9036/9038; and
- Ferrous iron using EPA Method 200.7 or SW-6010.

Finally, analysis of groundwater salinity parameters was performed to evaluate the extent of salinity from sea water mixing with the groundwater. All groundwater samples were analyzed for the following parameters:

- Total dissolved solids (TDS) using EPA Method 160.1; and
- Chloride using EPA Method 300.0/325.3.

3.3 SAMPLING AND SAMPLE HANDLING

Sampling was scheduled to occur during a period of minimal tidal fluctuations during the sampling period. Scheduling sampling during a period of an intermediate tidal stage when diurnal tidal fluctuations were minimal was intended to yield consistent, reproducible data that reflected average conditions, and could be readily implemented in the field.

3.3.1 Well Purging

Prior to sampling, each well was monitored for the presence of organic vapors using a photoionization detector (PID), sounded for depth to groundwater, and purged of a minimum of three well volumes. Disposable bailers were used to purge the 2-inch and 4-inch wells. The 8-inch wells were purged using a compressed air-powered diaphragm pump. Purged water was placed into 55-gallon drums and transferred to the contractors wash pad area, for treatment at the Refinery wastewater treatment facility.

3.3.2 Field Parameters

During purging, the following field parameters were measured:

- temperature;
- pH;
- electrical conductivity;
- dissolved oxygen; and
- oxidation-reduction potential.

These parameters were monitored during well purging to evaluate the adequacy of purging and to provide the field intrinsic biodegradation data. A downhole dissolved oxygen monitor was used. All other field parameters were measured in a flowcell attached to a peristaltic pump. Dissolved oxygen was not measured in well D7-15 as a sheen of LNAPL was observed floating on the groundwater.

Water was purged until water quality parameters had stabilized or 3 to 5 well volumes had been removed from the well, whichever was less. Stabilization of water quality parameters included three consecutive readings for pH to ± 0.2 units, specific conductivity to ± 5%, and temperature to ± 0.1 °C.

3.3.3 Groundwater Sample Collection

Samples were collected within 24 hours of purging from wells A3-62, C6-58, C6-56, C7-54, D7-51, D8-50, and D8-48. Samples were collected from all other wells immediately following purging.

Samples were collected in the following order:

Volatile organics: Samples for volatile organics were collected using a disposable bailer fitted with a bottom emptying device. Samples were placed in 40-milliliter (ml) VOA vials.

Other organics: Samples for other organics were collected using a disposable bailer fitted with a bottom emptying device. Samples were placed in 1-liter amber glass bottles.

Ferrous iron: Samples for ferrous iron were collected using the peristaltic pump. A disposable 0.45-micron membrane filter was placed in-line along the discharge hose of the pump. The apparatus was kept shaded from the sun during sampling. Samples were placed in 250ml plastic bottles.

Metals: Samples for metals were collected using a disposable bailer fitted with a bottom emptying device. Samples were placed in a 1-liter plastic bottle preserved with nitric acid.

Other samples: Samples for intrinsic biodegradation parameters (alkalinity, nitrate, and sulfate) and salinity parameters (total dissolved solids and chloride) were collected using a disposable bailer fitted with a bottom emptying device. Samples were placed in 500ml plastic bottles.

3.4 CHEMICAL ANALYSIS

Samples were sent to Lockheed Laboratory of Las Vegas, Nevada to be analyzed for the project analytical program. Ferrous iron samples were analyzed by the Environmental Laboratory of the Pacific (ELP) in Honolulu, Hawaii, rather than Lockheed, due to short holding time limitations. All laboratory results from Lockheed were analyzed on a normal turn-around-time basis, and results were submitted in both electronic data deliverable (EDD) and hard-copy format. Dames & Moore performed Data Quality Objective (DQO) level 3 data validation on all of the data. Following completion of the data validation, the data were included in an electronic database.

4.0 GROUNDWATER ANALYTICAL RESULTS AND DISCUSSION

The dissolved phase investigation results include both field and laboratory data. Field data included the results of monitoring of field parameters during well purging, including the intrinsic biodegradation parameters dissolved oxygen, pH and oxidation-reductionpotential. Laboratory data included organic compounds (VOCs, SVOCs, BTEX and PAHs) and inorganic parameters (metals, salinity, and intrinsic biodegradation parameters). This section summarizes the analytical results from this investigation; the data have been used for risk evaluation (Appendix D), as summarized in Section 5.0. Conclusions, including discussion of the results, evidence of impacts from LNAPL and the SWMUs, and conclusions from the Risk Evaluation, are presented in Section 6.0.

4.1 FIELD PARAMETERS

Table 2 presents a summary of the final field parameters collected at the completion of well purging. All field parameter observations were recorded on field data sheets during well purging. Most of the field parameters stabilized within a couple casing volumes; however, oxidation-reduction potential typically required more time to stabilize. Table 2 also shows the volume of groundwater purged from each well.

The field parameter data are summarized on Figure 6. There are a couple of general patterns that can be observed from these data, including: electrical conductivity, dissolved oxygen and oxidation-reduction potential tend to increase in a downgradient (towards the ocean) direction. These trends are most apparent in the north and central profile areas, and are not clearly evident along the south profile.

4.2 LABORATORY PARAMETERS

Laboratory analyses were performed for all organic and inorganic constituents identified in the analytical program. Most of the organic compounds that were analyzed, and several of the metals, were not detected at concentrations in excess of the laboratory practical quantitation limits (PQLs). Table 3 presents a summary of all parameter concentrations detected in excess of the PQLs. A more complete summary of all analytical results is included in Appendix A - Laboratory Data Summaries. The Appendix A summary tables show the specific PQLs for all analyses, and estimated values of compounds detected at concentrations above the method detection limits (MDLs) and below the PQLs. Data flags established during the data validation are shown on the Appendix A summary tables. Validation reports are included in Appendix B.

4.2.1 Volatile Organic Compounds

All VOCs were analyzed using EPA method 8260; however, at several of the wells, quantification of BTEX constituents only was specified. The full 8260 analyses were performed to more fully characterize groundwater conditions at the upgradient well in each profile, and at supplemental locations downgradient of potential RFI source areas.

The results of the VOC analyses indicated that only BTEX compounds were quantified at concentrations in excess of PQLs. The BTEX results are presented on Figure 7. The data indicates

the presence of low concentrations (in some cases below the PQL) of individual BTEX compounds at the upgradient well in the northern and central profile lines, with no detections of these compounds further downgradient. At the southern profile, BTEX is not detected at the most upgradient well D7-34, but was detected further downgradient. Highest BTEX concentrations were found at well D7-15, and the BTEX concentrations decreased downgradient of well D7-15. These results are consistent with the observed presence of LNAPL at wells D7-15 and D7-33. The VOC detections being limited to BTEX is consistent with the constituents associated with LNAPL, and indicates an absence of chlorinated compounds that may have been used at, or derived from wastes from the SWMUs.

4.2.2 Semi Volatile Organic Compounds

All SVOCs were analyzed using EPA method 8270. Full 8270 analyses were performed for selected wells, and other wells were analyzed only for PAHs. To achieve the low detection limits desired for risk assessment purposes, selected ion monitoring (SIM) procedures were used for the PAH analyses. Wells C3-65, C4-76, D6-R34, C6-R04, B5-R08, C7-54, D7-34, D8-50, and I3-67 were analyzed for the full 8270 analyses.

The primary SVOC compounds detected were PAHs. The PAH concentrations detected in excess of the PQLs are shown for each well on Figure 8. The data indicate that the highest PAH concentrations in the northern and central profiles are found at the upgradient wells, and the PAH concentrations attenuate in a downgradient direction. At the south profile area, a pattern similar to that observed for the BTEX data is evident for the PAHs. At the upgradient well D7-34, PAHs were not detected; however, relatively high concentrations were observed at well D7-15. PAH concentrations attenuate downgradient of well D7-15. As with the BTEX results, these PAH data are consistent with the presence of the LNAPL found in the D7-15 area.

Only one 8270 compound besides the PAH compounds was detected at a concentration above the PQL. Bis (2 ethylhexyl) phthalate was detected at concentrations above the estimated MDL at wells C3-65, C4-76, D6-R34, D8-50 and I3-67. Bis (2 ethylhexyl) phthalate is a common plasticizer compound that is also a commonly encountered laboratory cross-contaminant, which may be the source of this compound in some or all of the samples. The 340 micrograms per liter (μg/L) concentration of bis (2 ethylhexyl) phthalate found in the sample from well D6-R34 is a relatively high concentration of this compound to be due to laboratory cross-contamination. Potential sources for this compound at well D6-R34 are unknown; the well is located in the LNAPL plume area.

4.2.3 Metals

Analyses were completed for arsenic, chromium, lead, mercury, nickel and vanadium; low concentrations of several of these metals were detected at a few wells as shown on Table 3. At well D7-34 all of the metals were detected. These data suggest a localized area at well D7-34 with metals impacts observed in the groundwater. All other wells metals concentrations are likely due to low-level background or regional dissolved metals conditions.

4.2.4 Salinity Parameters

Salinity parameters (TDS and chloride) were typically detected in most of the wells, consistent with naturally occurring dissolved groundwater chemistry. Figure 9 shows the inorganic constituent data, which are summarized in Table 4. The salinity trend is clearly shown by the TDS data shown on Table 4. TDS ranges 2,000 to 15,000 milligrams per liter (mg/L), with higher concentrations consistently observed at the wells located nearest the ocean. A similar trend is observed using the chloride data.

4.2.5 Intrinsic Biodegradation Parameters

Evaluation of intrinsic biodegradation parameters is described in a draft American Society for Testing and Materials (ASTM, 1996) standard, and involves comparison of inorganic constituent data between water samples from inside and outside of a hydrocarbon source area for evidence of biological activity related to natural attenuation of petroleum hydrocarbons. For example, a reduction in sulfate or ferric iron concentrations (yielding an increase in ferrous iron) in wells inside of a plume relative to wells outside of the plume may indicate the presence and activity of sulfate or ferric iron consuming biota that reduce hydrocarbon concentrations, ultimately yielding carbon dioxide and water. Such reactions may also be indicated by a decrease in dissolved oxygen and an increase in dissolved and water carbon dioxide, yielding an increase in bicarbonate alkalinity. Alkalinity values tend to increase from outside of the plume to inside of the plume. It should be noted that alkalinity tends to increase when respiration of microorganisms occur, and in the dissolution of rock (especially in carbonate rocks).

Groundwater parameter values at which biodegradation can occur include:

- pH between 6 and 8; and
- Temperature between 5 and 25 degrees centigrade (°C), and biodegradation may increase in increasing temperatures.

Intrinsic biodegradation may occur under either aerobic (requiring oxygen) or anaerobic (lacking oxygen) conditions. Anaerobic degradation conditions are generally indicated by the following:

- Dissolved oxygen at concentrations of less than 1 mg/L;
- Reducing conditions where the oxidation-reduction potential of groundwater is negative;
- Nitrate is reduced to nitrite;
- Sulfate is reduced to sulfide; and
- Ferric iron is reduced to ferrous iron, thus ferrous iron increases.

Therefore, the key intrinsic biodegradation indicator parameters in which significant trends are most likely to be observed include pH, dissolved oxygen, oxidation-reduction potential, alkalinity, sulfate, nitrate, and ferrous iron. Temperature and electrical conductivity are field measurements that are routinely acquired during well purging. The temperature range at all of the wells is relatively warm, and suitable for biological activity. TDS and chloride data were collected to evaluate salinity impacts that may influence evaluation of electrical conductivity and other biodegradation parameter data. At this site, due to the proximity of the ocean, electrical conductivity, TDS, and chloride are more indicative of groundwater salinity than biodegradation activity.

Figure 9 summarizes the observed concentrations of the laboratory intrinsic biodegradation parameters at the site, and Figure 6 presents the field parameter data. The intrinsic biodegradation parameters concentrations are summarized in Table 4. Additional intrinsic biodegradation parameter data collected during site assessment investigations (Dames & Moore, 1997a, 1997b, 1997c, 1997d) in the fall of 1996 from off-site background wells on parcels adjacent to the Refinery are summarized in Table 5. The off-site well locations are shown on Figure 2 and Figure 6 through Figure 9.

Comparison of the data shown in Tables 4 and 5 and on Figure 9 show trends indicative of intrinsic biodegradation. This comparison is also summarized on Figure 10, which shows a bar-graph of the intrinsic biodegradation parameter concentrations with the wells grouped by area (background,

LNAPL and impacted wells, and Backyards Area downgradient wells). Trends that are present include bicarbonate enrichment and sulfate reduction, nitrate reduction, lower dissolved oxygen concentrations, and lower oxidation-reduction potentials present in the Backyards Area relative to the upgradient and offsite wells. Field parameters of dissolved oxygen and oxidation-reduction potential indicate that decreasing oxygen levels and a more strongly reducing environment is present at wells located within or near the LNAPL. These trends are all consistent with the occurrence of intrinsic biodegradation.

4.3 QUALITY CONTROL DATA

Quality Assurance/Quality Control (QA/QC) procedures were defined in the Workplan, and included: field and laboratory duplicate analyses; travel and equipment blanks; matrix spike and matrix spike duplicate samples; and laboratory QA procedures.

Samples were collected during the Backyards Area groundwater sampling to monitor the quality of the sampling, decontamination, and laboratory analytical procedures. Approximately 10 percent (2 samples) of the groundwater samples were collected in duplicate. Both duplicate samples were analyzed by the contract laboratory for all investigation program parameters. The duplicate samples were named such that they were "blind" samples (i.e., the contract laboratory did not know that they were duplicates).

Equipment Blank samples were collected from decontaminated equipment to monitor the effectiveness of the decontamination procedures. After decontamination, distilled water was passed over the sampling equipment and collected for analysis using the appropriate sample containers. An equipment blank sample (a frequency of one per 20 samples collected) was collected from the interface probe and purge pump used during this project.

Travel blanks are prepared by the analytical laboratory using laboratory grade clean water. These samples were shipped from the laboratory with the clean sample containers and were returned to the laboratory in the iced cooler along with the collected groundwater samples from the field. One travel blank was included with each shipment to the laboratory and was analyzed for VOCs by EPA Method 8260.

The results of the QA samples analyzed for this investigation are summarized in the data summary tables (Appendix A), and the laboratory reports from these analyses are included in the Appendix C.

4.4 DATA VALIDATION

All laboratory data were validated prior to completion of the project report. Validation procedures included the following:

- Review of holding times for each sample and analytical method;
- Review of proper analytical methods as requested on the COC;
- Review of proper detection limits for each analytical method;
- Review proper reporting of results, and flagging of chemical data for qualitative and quantitative issues (missed holding times, elevated detection limits due to dilution of sample, etc.); and
- Work with contract laboratory in correcting errors in data packages.

The validation reports for this project are included in Appendix B.

5.0 RISK AND PATHWAY EVALUATION SUMMARY

A refined Conceptual Site Model (CSM) was prepared to evaluate the potential human and ecological health risks associated with 1) the LNAPL plume; 2) the associated dissolved phase components in groundwater; and 3) chemically-impacted soils in the Backyards Area. This section summarizes the CSM process and major findings of the refined CSM that is included as Appendix D.

The three main elements of the refined CSM are identification of the following:

- Sources, types of contamination, and chemicals of potential concern (COPC), including a discussion of environmental fate and transport;
- Potential human and ecological receptors; and
- Potentially complete pathways of exposure.

For purposes of the risk assessment, LNAPL samples were collected and analyzed for VOCs, SVOCs and metals from two wells (C4-66 and D7-35) in the Backyards Area. The analytical data for the dissolved phase groundwater and LNAPL were used to identify COPCs. Figures 11 and 12 present a summary of the potential transport mechanisms and complete exposure pathways for human and ecological receptors, respectively, in the Backyards Area.

5.1 COPCs

Chemically-impacted soils were previously evaluated as part of the RFI (Engineering Science, 1993). Dissolved phase groundwater and LNAPL COPCs were independently selected for human and ecological receptors based upon comparison to media-specific and receptor-specific risk-based screening levels (RBSLs). In addition, the frequency of detection, background levels of inorganics, and potential for laboratory contamination were other criteria used in the COPC selection process (Figure 13).

5.1.1 Soil COPCs

Based on the RFI (Engineering Science, 1993), levels of ethylbenzene, methylnaphthalene, phenanthrene, nickel and organic lead in near surface soils exceeded HDOH criteria in the North Ocean Pond and levels of chromium exceeded HDOH criteria in near surface soils in the South Ocean Pond. Nets have been placed at these ponds to limit access. Although COPCs may also be associated with the subsurface soils in the capillary fringe zone in the plume area of the Backyards Area and in near surface soils in the netted areas of the North and South Ocean Ponds, direct contact pathways for subsurface soil for current and future on-site and off-site workers are incomplete. The relative contribution of volatile COPCs in soils relative to the volatile COPCs in LNAPL is considered minimal.

5.1.2 Dissolved Phase Groundwater and LNAPL COPCs

Dissolved phase groundwater and LNAPL COPCs were independently selected for human and ecological receptors based upon comparison to media-specific and receptor-specific RBSLs. The COPCs for human and ecological receptors for each environmental medium are summarized as follows:

Dissolved Phase Groundwater COPCs		Soil COPCs		LNAPL COPCs	
Human	**Ecological**	**Human**	**Ecological**	**Human**	**Ecological**
Benzo(a)anthracene	Benz(a)anthracene	Ethylbenzene	Ethylbenzene	Benzene*	Ethylbenzene
Benzo(a)pyrene	Benzo(a)pyrene	Methylnaphthalene	Methylnaphthalene	Ethylbenzene	Toluene
Benzo(b)fluoranthene	Benzo(b)fluoranthene	Phenanthrene	Phenanthrene	Toluene	Xylenes
Benzo(g,h,i)perylene	Benzo(g,h,i)perylene	Chromium	Chromium	Xylenes	Chrysene
Chrysene	Chrysene	Nickel	Nickel	Chrysene	Pyrene
Dibenz(a,h)anthracene	Dibenz(a,h)-anthracene	Organic lead	Organic lead	Pyrene	1-Methylnaphthalene
Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene			1-Methylnaphthalene	2-Methylnaphthalene
Naphthalene	Fluorene			2-Methylnaphthalene	Acenaphthene
Bis (2-	Phenanthrene			Acenaphthene	Fluorene
ethylhexyl)phthalate	Pyrene			Fluorene	Naphthalene
Arsenic	Bis (2-ethylhexyl) phthalate			Naphthalene	Phenanthrene
Chromium	Arsenic			Phenanthrene	Arsenic
Lead	Chromium			Arsenic	Chromium
Mercury	Lead			Chromium	Copper
	Mercury			Copper	Vanadium
	Nickel			Vanadium	Zinc
	Vanadium				

*Not detected; detection limit exceed the risk-based screening level (RBSL).

Dissolved phase groundwater COPCs included semivolatile, and non-volatile chemicals. COPCs in LNAPL included volatile, semi-volatile chemicals and nonvolatile chemicals.

5.2 RECEPTORS

The human receptors potentially exposed to site contaminants were current and future on-site and off-site workers, recreational users of the Pacific Ocean and future construction workers. The primary ecological receptors potentially exposed to site contaminants under current and future site conditions are aquatic organisms, various species of birds and the mongoose, a mammal.

5.3 EXPOSURE PATHWAYS AND QUALITATIVE RISK EVALUATION

The primary pathways of concern are summarized below for both current and future conditions. For current conditions for ecological receptors, there are no LNAPL COPCs because the LNAPL is not at the ocean. The dissolved phase groundwater chemical concentrations from wells at the perimeter of the Refinery nearest to the ocean were below RBSLs, indicating insignificant exposure. Therefore, there are no potential ecological hazards in the Backyards Area to ecological receptors under current conditions. For human recreational users, arsenic and mercury were identified as dissolved phase groundwater COPCs in the wells nearest the ocean under current conditions. However, concentrations of these chemicals were comparable to levels found normally in seawater; high salinity is present at the wells near the ocean. Future worst case conditions, under the health-protective assumption that the LNAPL and dissolved phase groundwater were to migrate to the ocean without any dilution or attenuation, were represented by selecting the maximum detected chemical level for any well for both human and ecological receptors.

Under current conditions, none of the dissolved phase groundwater COPCs except arsenic and mercury were found in sufficient concentration in the wells located nearest to the Pacific Ocean to pose a potential human health threat to recreational users of the ocean. Arsenic and mercury levels exceeded their respective RBSLs that were derived from Ambient Water Quality Criteria (AWQC) based on fish consumption. However, the arsenic and mercury levels were considered within range of naturally occurring levels in seawater.

The monitoring data and visual observations indicate the LNAPL has not migrated to the Pacific Ocean to date, nor is it likely to in the future. LNAPL migration to the ocean in the future is unlikely due to the flat groundwater gradient; high residual water saturation in the vadose zone that is maintained by tidal fluctuations; and monitoring observations that the plume is stable. In the unlikely event that the LNAPL plume were to reach the ocean and create a sheen, a potential chemical and physical hazard to breeding birds may be created. Therefore, a plume stability evaluation program has been implemented (Chevron, 1997).

Current and future on-site workers could potentially be exposed to volatile chemicals released from the LNAPL into indoor air. These exposures will be addressed in a separate report which evaluates an industrial worker scenario using a worst-case indoor air scenario for buildings at the Refinery. There are no identified ecological health threats from the hydrocarbon plume. The following summarizes the results of this refined CSM:

Receptor	Type of COPCs	Pathway	Risk	Action
Current Conditions				
On-site Indoor Worker	**Groundwater**-Semivolatile, Nonvolatile **LNAPL** -Volatile, Semivolatile, Nonvolatile **Soil** -Volatile, Semivolatile, Nonvolatile	Inhalation	Potential exposure to chemicals in groundwater and LNAPL	Tier II On-site Industrial Worker Risk Assessment (In Progress)
Off-site Worker		Inhalation	Insignificant exposure	None
Recreational User		Dermal, Ingestion	Insignificant exposure	None
Organisms in Ocean; Pelagic Birds and Shorebirds		Uptake	Insignificant exposure	None
Terrestrial Birds and Mammals		Inhalation	Insignificant exposure	None
Future Conditions				
On-site Indoor Worker	**Groundwater**-Semivolatile, Nonvolatile **LNAPL** -Volatile, Semivolatile, Nonvolatile **Soil** -Volatile, Semivolatile, Nonvolatile	Inhalation	Potential exposure to chemicals in groundwater and LNAPL	Tier II On-site Industrial Worker Risk Assessment (In Progress)
Off-site Worker		Inhalation	Insignificant exposure	None
Construction Worker		Inhalation, Dermal, Ingestion	Potential exposure to chemicals in groundwater and LNAPL	Institutional Controls
Recreational User		Dermal Ingestion	Potentially significant exposure; contingent upon plume migration	Plume Stability Evaluation Program
Organisms in Ocean; Pelagic Birds and Shorebirds		Uptake	Potentially significant exposure; contingent upon plume migration	Plume Stability Evaluation Program
Terrestrial Birds and Mammals		Inhalation	Potentially significant exposure; contingent upon plume migration	Plume Stability Evaluation Program

6.0 SUMMARY AND CONCLUSIONS

This report summarizes the results of an investigation to evaluate concentrations of, and human health and ecologic risks associated with, organic and inorganic constituents dissolved in groundwater in the Backyards Area of the Chevron Hawaii Refinery, Kapolei, Oahu, Hawaii. The field work for the investigation was conducted in June, 1996 by groundwater sampling and analysis using existing wells at the Refinery. The human health and ecological risk assessment evaluated LNAPL and chemically impacted soil, as well as dissolved phase constituents.

The June 1996 sampling was the first systematic assessment of dissolved phase groundwater constituents in the Backyards Area of the Refinery, and therefore constitutes a baseline assessment of Refinery groundwater conditions. As a baseline assessment, extensive lists of chemical parameters and monitoring wells were evaluated. Data from the June 1996 sampling reveal chemical trends, and target wells and chemical constituents for future investigation and monitoring. The results from this investigation have been used to develop a Plume-Wide Groundwater Monitoring Program (PGMP), which has been submitted to and approved by the EPA (Chevron, 1997).

6.1 LNAPL

LNAPL was found in three of the wells (D6-R34, D7-15 and D7-33) sampled. Of these three wells, the presence of LNAPL at well D6-R34 was anticipated based on previous LNAPL delineation and periodic visual monitoring. At wells D7-15 and D7-33, LNAPL has not previously been observed. The LNAPL was observed to enter wells D7-15 and D7-33 during well purging. The presence of the LNAPL at wells D7-15 and D7-33 indicates a small localized area with a thin accumulation of LNAPL floating on the groundwater table.

The LNAPL in this area appears to be physically separated from other Refinery Backyards Area LNAPL to the north. Several un-impacted wells are visually monitored on a monthly basis between the D7-15 and D7-33 area and the LNAPL area to the north, including: D6-55; D7-53; D7-52; and D7-34 (Figure 5). Due to the presence of LNAPL in this area, wells D7-51 and D8-50 have been added as visual monitoring wells in the PGMP. Following the discovery of this LNAPL area, Chevron performed additional visual monitoring of all wells in the vicinity, and LNAPL was not observed in any other wells in the vicinity.

The presence of LNAPL in this area is believed to be responsible for the relatively higher concentrations of dissolved phase constituents found in wells located along the south profile.

6.2 DISSOLVED PHASE CONSTITUENTS

The primary organic constituents observed in the dissolved phase data are BTEX and PAH compounds. BTEX and PAH compounds were not detected in either the upgradient or cross gradient background wells. No other VOCs and SVOCs have been detected at any of the wells included in this investigation at concentrations in excess of laboratory PQLs, except for bis (2 ethylhexyl) phthalate, a commonly observed laboratory cross-contaminant. The organic compound data do not indicate the presence of constituents unrelated to LNAPL (such as chlorinated solvents) that potentially could have been due to the SWMUs described in the RCRA facilities investigations. The data from this investigation provide additional data to indicate that no further action, including groundwater monitoring, is necessary with respect to SWMUs located in the Backyards Area.

The data indicate that the concentrations of the organic constituents that were detected attenuate rapidly in a downgradient direction. This is clearly evident in the data from the north and central profiles. The south profile wells exhibit higher constituent concentrations, which is consistent with the presence of the LNAPL found in the D7-15 and D7-33 area. Data from wells D7-51 and D8-50 indicate that organic constituent concentrations also attenuate in a downgradient direction from this area.

The priority pollutant metals results indicate that metals are not constituents of concern at most of the wells sampled. With the exception of well D7-34, metals concentrations observed were within the range of concentrations typical of background conditions, considering the groundwater salinity. Metals concentrations observed at well D7-34 are considerably higher than background well concentrations, or the concentrations observed at all other Backyards Area wells. This suggests the presence of a localized metals impact area. The metals concentrations in this area appear to attenuate rapidly in a downgradient direction, based on the data from well D7-15.

Intrinsic biodegradation monitoring parameters reveal trends indicative of on-going in-situ biodegradation of dissolved constituents from the LNAPL. The trends are most apparent in the sulfate, dissolved oxygen and oxidation reduction potential data, all of which increase in concentration with distance downgradient from the LNAPL. The trends are also most evident when the Backyards Area well data are compared to data from off-site wells, and the trends are more

clearly apparent in the data from the north and central profiles. The south profile data are believed to be influenced by the presence of LNAPL in the D7-15 and D7-33 area. The pH and nitrogen data suggest a similar, less well defined trend.

Superimposed on the inorganic data is the trend of increased salinity with proximity to the ocean. The salinity trend is clearly evident in the TDS and chloride data.

6.3 RISK ASSESSMENT SUMMARY

Under current conditions, none of the dissolved phase groundwater COPCs except arsenic and mercury were found in sufficient concentration in the wells located nearest to the Pacific Ocean to pose a potential human health threat to recreational users of the ocean. Arsenic and mercury levels exceeded their respective RBSLs that were derived from AWQC based on fish consumption. However, the arsenic and mercury levels were considered within range of naturally occurring levels in seawater; high salinity is present at the wells near the ocean.

Monitoring data and visual observations indicate the LNAPL has not migrated to the Pacific Ocean. LNAPL migration to the ocean in the future is unlikely due to the flat groundwater gradient, high residual water saturation of the vadose zone due to tidal fluctuations, and monitoring observations that the plume is stable.

Current and future on-site workers could potentially be exposed to volatile chemicals released from the LNAPL into indoor air. These exposures will be addressed in a separate report which evaluates an industrial worker scenario using a worst-case indoor air scenario for buildings at the Refinery. There are no identified ecological health threats from the hydrocarbon plume.

6.4 FUTURE MONITORING

The data from this investigation were developed by sampling and analysis of 19 wells in the Backyards Area during June 1996. The data from the June 1996 provide a baseline set of data for comparison with future sampling events. Based on the data from this investigation, a reduced number of wells and monitoring parameters would be effective for future monitoring. The additional monitoring recommendations have been implemented through the PGMP.

6.4.1 Visual LNAPL Monitoring

The objective of the visual monitoring is to evaluate data trends that will provide indications of LNAPL plume stability or migration. Visual monitoring is an on-going program formally established in August 1995 in the Backyards Area. Visual monitoring in the Backyards Area was expanded during July 1996 and again following completion of the offsite assessment investigations to include additional wells around the perimeter of the Refinery.

No evidence of LNAPL plume migration has been observed, and the data to date provide positive evidence of LNAPL plume stability.

The visual monitoring wells in the Backyards Area are shown on Figure 5. The visual monitoring parameters include physical observation of groundwater and LNAPL levels within the monitoring well using an interface probe.

The data from the historic Backyards Area visual monitoring and from all other perimeter areas have shown evidence that the LNAPL plume is stable. Monitoring is recommended to be performed on a quarterly basis, and the data will be reviewed annually to evaluate whether wells should be added or deleted from the program. All visual monitoring is scheduled to be performed during low tide periods when the potential to observe LNAPL in the wells is greatest.

6.4.2 Dissolved Phase Groundwater Monitoring

The objectives of groundwater monitoring for dissolved phase indicator parameters include the following: 1) to provide early identification of dissolved phase constituents at the LNAPL plume perimeter; and 2) to document trends in constituent concentrations. The conclusions from the dissolved phase data evaluation to date are that dissolved phase impacts attenuate rapidly downgradient and cross gradient of the LNAPL plume, and that the primary constituents of concern include BTEX, and locally specified PAHs. Elevated priority pollutant metals concentrations were not found, except at well D7-34 in the Backyards Area.

The recommended dissolved phase monitoring points in the Backyards Area include a total of 4 wells. All wells selected are outside of the LNAPL plume. The Backyards Area will be monitored by wells D8-50, D7-34, C6-58 and C4-76. All selected wells are to be monitored for BTEX. BTEX has been selected due to solubility and mobility considerations, to provide for detection of migration

or stability. A short list of specified PAHs including naphthalene, 1-methylnaphthalene and 2-methylnaphthalene is additionally recommended for Well D8-50.

Priority pollutant metals are not recommended for further monitoring because metals are considered to be poor indicator parameters for plume monitoring due to low mobility, and because of the general low concentrations of metals detected. At well D7-34, metals concentrations indicated a localized area of concern. An additional sampling event for metals at this well is planned to verify the previous results.

Monitoring is recommended to be completed on a semiannual basis during 1997, after which the program will be reviewed and evaluated for the monitoring frequency, the selection of monitoring wells, and parameters.

6.4.3 Intrinsic Biodegradation Monitoring

The objective of monitoring for intrinsic biodegradation parameters throughout the plume is to continue trending of removal of hydrocarbons by natural attenuation processes. The initial plume-wide remediation by natural attenuation (RNA) monitoring results indicated that intrinsic biodegradation is occurring throughout the plume, although indicator parameters vary from location to location.

To perform this characterization, it is necessary to compare indicator parameter concentrations between areas within the LNAPL plume to areas outside of the LNAPL plume. The intrinsic biodegradation compounds for which data will be collected include dissolved oxygen, oxidation-reduction potential, pH, electrical conductivity, temperature, alkalinity, nitrate, sulfate, and ferrous iron. Measurement of these parameters will provide the data needed to evaluate the effectiveness of intrinsic biodegradation as a component of RNA of the dissolved hydrocarbon impacts.

Recommended intrinsic biodegradation monitoring points include 4 wells in the Backyards Area. The well coverage has been selected to provide wells inside and outside of the LNAPL plume. The Backyards Area will be monitored by wells C4-66 and well D6-08 for inside the LNAPL plume, and wells B4-61 and C6-58 as wells outside of the LNAPL plume. A replacement well for C4-66 may need to be established due to planned recovery operations at that well.

The ongoing intrinsic biodegradation parameters to be collected include dissolved oxygen, oxidation-reduction potential, pH, bicarbonate alkalinity, sulfate, nitrate, and ferrous iron. Temperature and electrical conductivity (EC) should continue to be collected as part of purging of the monitoring wells; however, these data do not appear useful to evaluate intrinsic biodegradation. Ferrous iron and nitrate should be retained for at least one additional monitoring period; however, based on existing data, these parameters are expected to indicate only localized trends and will be discontinued in areas where trends are not observed. A trial data collection (one monitoring event) is planned for dissolved carbon dioxide and manganese.

Monitoring for intrinsic biodegradation parameters will be performed semiannually during 1997 to establish background conditions and data trends. Following this monitoring, the program should be reevaluated, and the monitoring frequency reduced or eliminated.

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TABLES

TABLE 1
SUMMARY OF GROUNDWATER SAMPLES AND CHEMICAL ANALYSES
DISSOLVED PHASE INVESTIGATION - JUNE 1996
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

Profile	Sample Location	Sample ID	BTEX EPA 8260	VOCs EPA 8260	PAHs EPA 8270 SIM	SVOCs EPA 8270	Metals EPA 6000/7000	Intrinsic Parameters [1]	Salinity Parameters [2]
North	C4-76	C4-76		X	X	X	X	X	X
	Duplicate of C4-76	B8-D2		X	X	X	X	X	X
	B4-61	B4-61	X		X		X	X	X
	A3-62	A3-62	X		X		X	X	X
Central	D6-R34	D6-R34		X	X	X	X	X	X
	C6-R36	C6-R36	X		X		X	X	X
	Duplicate of C6-R36	B8-D1	X		X		X	X	X
	C6-R37	C6-R37	X		X		X	X	X
	C6-56	C6-R56		X	X	X	X	X	X
South	D7-34	D7-34		X	X	X	X	X	X
	D7-15	D7-15	X		X		X	X	X
	D7-33	D7-33	X		X		X	X	X
	D7-51	D7-51	X		X		X	X	X
Background	C2-64	C2-64		X	X	X	X	X	X
	I3-67	I3-67		X	X	X	X	X	X

TABLE 1
SUMMARY OF GROUNDWATER SAMPLES AND CHEMICAL ANALYSES
DISSOLVED PHASE INVESTIGATION - JUNE 1996
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

Profile	Sample Location	Sample ID	BTEX EPA 8260	VOCs EPA 8260	PAHs EPA 8270 SIM	SVOCs EPA 8270	Metals EPA 6000/7000	Intrinsic Parameters [1]	Salinity Parameters [2]
Additional Wells	C3-65	C3-65		X	X	X	X	X	X
	B5-R08	B5-R08		X	X	X	X	X	X
	C6-R04	C6-R04		X	X	X	X	X	X
	C6-58	C6-58	X		X		X	X	X
	D8-48	D8-48		X	X	X	X	X	X
	C7-54	C7-54		X	X	X	X	X	X
	D8-50	D8-50		X	X	X	X	X	X
N/A	Travel Blank	TBS		X					
N/A	Equipment Blank	EBS	X		X		X		

Notes:
Additional wells = Near locations of potential source areas identified in the RCRA Facilities Investigation Report by Engineering Sciences, Inc., November 1993
BTEX = Benzene, toluene, ethylbenzene, and total xylenes
EPA = U.S. Environmental Protection Agency test method
Metals = Select metals include arsenic, cadmium, lead, mercury, nickel, and vanadium
N/A = Not applicable
PAHs = Polynuclear aromatics hydrocarbons
SVOCs = Semi-volatile organic compounds
TBS = Travel blank sample
VOCs = Volatile organic compounds
SIM = Selected ion monitoring
1 = Intrinsic parameters include alkalinity (EPA Method 310.2), nitrate (EPA Method 353.2), sulfate (EPA Method 375.4), ferrous iron (EPA Method 200.7), and field parameters (pH, temperature, conductivity, dissolved oxygen, and oxidation-reduction potential).
2 = Salinity parameters include total dissolved solids (EPA Method 160.1) and chloride (EPA Method 300.0/325.3).

TABLE 2
SUMMARY OF FINAL WELL PARAMETERS
DISSOLVED PHASE INVESTIGATION - JUNE 1996
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

Well	Date Purged	Volume Purged (gallons)	pH	Eletrical Conductivity (m℧/cm)	Dissolved Oxygen (mg/L)	Temperature (°C)	Oxidation-Reduction Potential (mV)
North Profile							
C4-76	6/24/96	16	7.9	4.25	0.11	30.1	-317
B4-61	6/21/96	18	6.89	2.73	0.23	32.4	-078
A3-62	6/19/96	15	7.42	15.49	0.69	27.4	+117
Central Profile							
D6-R34	6/21/96	130	6.96	13.12	0.38	29.0	-295
C6-R36	6/21/96	130	6.88	12.13	0.08	28.8	-027
C6-R37	6/20/96	120	7.03	13.20	0.09	29.6	-015
C6-56	6/19/96	15	7.36	15.53	0.26	28.7	+063
South Profile							
D7-34	6/21/96	1.5	7.74	1.8	0.03	31.7	-100
D7-15	6/21/96	17	6.98	12.6	N.M.	29.3	-363
D7-33	6/20/96	3	7.04	2.3	0.22	29.7	-303
D7-51	6/19/96	15	6.97	19.6	0.00	27.7	-381

TABLE 2
SUMMARY OF FINAL WELL PARAMETERS
DISSOLVED PHASE INVESTIGATION - JUNE 1996
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

Well	Date Purged	Volume Purged (gallons)	pH	Eletrical Conductivity (m℧/cm)	Dissolved Oxygen (mg/L)	Temperature (°C)	Oxidation-Reduction Potential (mV)
Background Wells							
C2-64	6/20/96	15	7.08	9.83	0.55	28.2	-062
I3-67	6/21/96	18	6.76	2.6	1.1	27.7	-078
Additional Wells							
C3-65	6/24/96	14	7.46	4.56	0.15	28.8	+053
B5-R08	6/24/96	100	7.33	13.2	0.19	28.8	-042
C6-R04	6/21/96	100	7.05	11.31	0.25	30.0	+054
C6-58	6/19/96	15	6.82	17.2	0.31	28.8	-232
D8-48	6/19/96	18	6.92	16.6	0.34	27.9	-088
C7-54	6/19/96	16	7.19	26.9	0.13	27.8	-110
D8-50	6/19/96	16	7.40	15.4	0.35	27.8	+371

Notes:
m℧/cm = micromho per centimeter (x1000)
mV = milli volts
N.M. = not measured
mg/L = milligrams per liter
Dissolved oxygen data collected as percent saturation, and converted to milligrams per liter in accordance with tables of temperature and salinity provided by the equipment manufacturer

TABL.
SUMMARY OF DETECTED COMPOUNDS
DISSOLVED PHASE INVESTIGATION - JUNE 1996
CHEVRON HAWAII REFINERY

		NORTH PROFILE					CENTRAL PROFILE					
ANALYTE	LOCATION DATE QA UNITS	C3-65 06/24/96	C4-76 06/24/96	C4-76 06/24/96 DUPLICATE	B4-61 06/21/96	A3-62 06/20/96	D6-R34 06/21/96		C6-36 06/21/96		C6-36 06/21/96 DUPLICATE	
VOCs												
THYLBENZENE	ug/L	--	--	--	--	--	5.8		--		--	
P-XYLENE	ug/L	--	--	--	--	--	--		--		--	
XYLENE	ug/L	--	--	--	--	--	--		--		--	
OLUENE	ug/L	--	--	--	--	--	--		--		--	
SVOCs												
METHYLNAPHTHALENE	ug/L	--	--	--	--	--	20.		--		--	
ENAPHTHENE	ug/L	--	12	9.8	--	--	2.9		--		--	
ENAPHTHYLENE	ug/L	--	1.7	1.6	--	--	0.36		--		--	
NTHRACENE	ug/L	--	0.58	0.35	--	--	0.22		--		--	
NZO(A)ANTHRACENE	ug/L	--	--	--	--	--	--		--		--	
NZO(A)PYRENE	ug/L	--	--	--	--	--	--		--		--	
NZO(B)FLUORANTHENE	ug/L	--	--	--	--	--	--		--		--	
NZO(G,H,I)PERYLENE	ug/L	--	--	--	--	--	--		--		--	
S(2-ETHYLHEXYL)PHTHALATE	ug/L	--	--	--	--	--	340	EJJQ	--		--	
RYSENE	ug/L	--	--	--	--	--	0.26		--		--	
BENZ(A,H)ANTHRACENE	ug/L	--	--	--	--	--	--		--		--	
UORANTHENE	ug/L	--	--	--	--	--	--		--		--	
UORENE	ug/L	--	1.3	1.2	--	--	1.2		--		--	
DENO(1,2,3-CD)PYRENE	ug/L	--	--	--	--	--	--		--		--	
APHTHALENE	ug/L	--	5	4.4	--	--	10	JJli	--		--	
ENANTHRENE	ug/L	--	0.27	0.23	--	--	0.32		--		--	
RENE	ug/L	--	0.17	0.16	--	--	0.66		0.13		0.11	
METALS												
SENIC, TOTAL	mg/L	--	--	--	0.032	--	--		--		--	
ROMIUM, TOTAL	mg/L	--	--	--	0.033	0.012	--		--		--	
AD, TOTAL	mg/L	--	--	--	--	--	--		--		--	
RCURY, TOTAL	mg/L	--	--	--	--	--	--		--		--	
CKEL, TOTAL	mg/L	--	--	--	--	--	--		--		--	
NADIUM, TOTAL	mg/L	--	--	--	--	--	--		--		--	
INTRINSIC PARAMETERS												
KALINITY, TOTAL (AS CACO3)	mg/L	320	330	330	1100	460	720		570		610	
LORIDE	mg/L	1000	900	1000	1300	5000	1600		3700		3700	
RROUS IRON	mg/L	--	--	--	0.6	--	0.8		1.4		1.3	
TRATE-NITRITE-NITROGEN	mg/L	0.27	0.14	0.15	0.020	BJJQ	0.21	0.030	BJJQ	0.042	BJJQ	0.040	BJJQ
LFATE	mg/L	250	120	120	180	730	11.		200		220	
TAL DISSOLVED SOLIDS	mg/L	2000	2400	2700	3100	8900	3200		5800		6000	

Data Validation Notes: See Attached Key

TABL.

SUMMARY OF DETECTED COMPOUNDS
DISSOLVED PHASE INVESTIGATION - JUNE 1996
CHEVRON HAWAII REFINERY

		CENTRAL PROFILE		CENTRAL - ADDITIONAL WELLS				SOUTH PROFILE		
LOCATION		C6-R37	C6-56	C6-R04	B5-R08	C6-58	C7-54	D7-34	D7-15	
DATE		06/20/96	06/20/96	06/21/96	06/24/96	06/20/96	06/20/96	06/21/96	06/21/96	
QA										
ANALYTE	UNITS									
VOCs										
HYLBENZENE	ug/L	--	--	--	--	--	--	--	54	
P-XYLENE	ug/L	--	--	--	--	--	--	--	180	
XYLENE	ug/L	--	--	--	--	--	--	--	120	
LUENE	ug/L	--	--	--	--	--	--	--	55	
SVOCs										
IETHYLNAPHTHALENE	ug/L	--	--	--	--	--	--	--	--	
ENAPHTHENE	ug/L	--	--	--	--	--	--	--	6.9	
ENAPHTHYLENE	ug/L	--	--	--	--	--	--	--	2.8	
THRACENE	ug/L	--	--	--	--	--	--	--	0.91	
NZO(A)ANTHRACENE	ug/L	--	--	--	--	--	--	--	0.71	
NZO(A)PYRENE	ug/L	--	--	--	--	--	--	--	0.59	
NZO(B)FLUORANTHENE	ug/L	--	--	--	--	--	--	--	0.33	
NZO(G,H,I)PERYLENE	ug/L	--	--	--	--	--	--	--	0.25	
:(2-ETHYLHEXYL)PHTHALATE	ug/L	--	--	--	--	--	--	--	--	
RYSENE	ug/L	--	--	--	--	--	--	--	1.6	
BENZ(A,H)ANTHRACENE	ug/L	--	--	--	--	--	--	--	--	
JORANTHENE	ug/L	--	--	--	--	--	--	--	0.2	
JORENE	ug/L	--	--	--	--	--	--	--	8	
DENO(1,2,3-CD)PYRENE	ug/L	--	--	--	--	--	--	--	--	
PHTHALENE	ug/L	--	--	--	--	--	--	--	460	J1
ENANTHRENE	ug/L	--	--	--	--	--	--	--	15	
RENE	ug/L	0.12	--	--	0.17	0.17	--	--	1.9	
METALS										
SENIC, TOTAL	mg/L	--	--	--	--	--	--	0.16	--	
ROMIUM, TOTAL	mg/L	--	--	--	--	--	--	0.33	--	
AD, TOTAL	mg/L	--	--	--	--	--	--	0.32	--	
RCURY, TOTAL	mg/L	--	--	--	0.00033	--	--	0.0026	--	
KEL, TOTAL	mg/L	--	--	--	--	--	--	0.24	--	
NADIUM, TOTAL	mg/L	--	--	--	--	--	--	0.24	--	
INTRINSIC PARAMETERS										
CALINITY, TOTAL (AS CACO3)	mg/L	560	460	520	440	400	320	8700	820	
LORIDE	mg/L	4600	6700	3400	4000	5700	9800	4000	3200	
ROUS IRON	mg/L	0.7	--	--	0.2	--	--	0.2	--	
RATE-NITRITE-NITROGEN	mg/L	0.070	0.21	0.14	4.8	--	0.075	0.11	--	
FATE	mg/L	270	810	220	480	470	1400	1600	1300	
TAL DISSOLVED SOLIDS	mg/L	6900	11000	5600	7200	9000	15000	8200	6700	

Data Validation Notes: See Attached Key

TABLE 3

SUMMARY OF DETECTED COMPOUNDS

DISSOLVED PHASE INVESTIGATION - JUNE 1996

CHEVRON HAWAII REFINERY

		SOUTH PROFILE		SOUTH - ADDITIONAL WELLS		BACKROUND WELLS	
	LOCATION	D7-33	D7-51	D8-50	D8-48	I3-67	C2-64
	DATE	06/20/96	06/20/96	06/20/96	06/20/96	06/21/96	06/20/96
	QA						
ANALYTE	UNITS						
VOCs							
ETHYLBENZENE	ug/L	9.5	--	9.7	--	--	--
M,P-XYLENE	ug/L	140	--	94	--	--	--
O-XYLENE	ug/L	19	14	37	--	--	--
TOLUENE	ug/L	6.2	--	12	--	--	--
SVOCs							
2-METHYLNAPHTHALENE	ug/L	--	--	15.	--	--	--
ACENAPHTHENE	ug/L	5.3	0.83	0.9	--	--	--
ACENAPHTHYLENE	ug/L	1.8	0.15	0.26	--	--	--
ANTHRACENE	ug/L	2.5	0.14	--	--	--	--
BENZO(A)ANTHRACENE	ug/L	3.4	--	--	--	--	--
BENZO(A)PYRENE	ug/L	4.4	--	--	--	--	--
BENZO(B)FLUORANTHENE	ug/L	2.7	--	--	--	--	--
BENZO(G,H,I)PERYLENE	ug/L	3.2	--	--	--	--	--
BIS(2-ETHYLHEXYL)PHTHALATE	ug/L	--	--	--	--	--	--
CHRYSENE	ug/L	9	--	--	--	--	--
DIBENZ(A,H)ANTHRACENE	ug/L	0.96	--	--	--	--	--
FLUORANTHENE	ug/L	1.3	--	--	--	--	--
FLUORENE	ug/L	5.3	0.8	1.1	--	--	--
INDENO(1,2,3-CD)PYRENE	ug/L	0.84	--	--	--	--	--
NAPHTHALENE	ug/L	3.5 J1	--	1.5 J1	--	--	--
PHENANTHRENE	ug/L	4.1	0.21	0.38	--	--	--
PYRENE	ug/L	9	0.11	--	--	--	--
METALS							
ARSENIC, TOTAL	mg/L	--	--	--	--	--	--
CHROMIUM, TOTAL	mg/L	0.039	--	--	--	--	0.028
LEAD, TOTAL	mg/L	--	--	--	--	--	--
MERCURY, TOTAL	mg/L	--	--	--	--	--	--
NICKEL, TOTAL	mg/L	--	--	--	--	--	--
VANADIUM, TOTAL	mg/L	--	--	--	--	--	--
INTRINSIC PARAMETERS							
ALKALINITY, TOTAL (AS CACO3)	mg/L	600	1000	860	430	360	1000
CHLORIDE	mg/L	2900	6200	4300	5100	870	6300
FERROUS IRON	mg/L	--	--	--	--	--	0.5
NITRATE-NITRITE-NITROGEN	mg/L	--	--	--	7.2	0.65	0.030 BJQ
SULFATE	mg/L	1300	1300	1500	2200	100	990
TOTAL DISSOLVED SOLIDS	mg/L	7000	11000	8600	10000	2100	11000

Data Validation Notes: See Attached Key

TABLE 3
BACKYARDS AREA DISSOLVED PHASE INVESTIGATION
CHEVRON HAWAII REFINERY
KAPOLEI, OAHU, HAWAII

LABORATORY VALIDATION QUALIFIERS DEFINITIONS
Assigned by Analytical Laboratory
(appears in Tables to left of vertical bar)

E	Concentration exceeds linear calibration range. Carried over in the validation process as a "J" qualifier.
U	Not detected at or above the associated reporting limit.
J	Estimated concentration above laboratory method detection limit (MDL) but below laboratory quantitation limit. Carried over in the validation process as a "J" qualifier.
B	Analyte was present in an associated blank.
D	Result from diluted sample.

DATA VALIDATION QUALIFIER DEFINITIONS
Assigned by Dames & Moore's Data Review Team
(appears in Tables to right of vertical bar)

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	Carry over from laboratory "E" or "J" qualifier, or the analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample reporting limit. However, the reported reporting limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

TABLE 4
INTRINSIC PARAMETER DATA
DISSOLVED PHASE INVESTIGATION - JUNE 1996
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

Well	pH	Dissolved Oxygen (mg/L)	Temperature (°C)	Oxidation Reduction Potential (mV)	Alkalinity (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Ferrous Iron (mg/L)	Chloride (mg/L)	Total Dissolved Solids (mg/L)
North Profile										
C4-76	7.9	0.11	30.1	-317	330	0.14	120	ND	900	2,400
B4-61	6.89	0.23	32.4	-078	1,100	0.020	180	0.6	1,300	3,100
A3-62	7.42	0.69	27.4	+117	460	0.21	730	ND	5,000	8,900
Central Profile										
D6-R34	6.96	0.38	29.0	-295	720	0.030	11	0.8	1,600	3,200
C6-R36	6.88	0.08	28.8	-027	570	0.042	200	1.4	3,700	5,800
C6-R37	7.03	0.09	29.6	-015	560	0.070	270	0.7	4,600	6,900
C6-56	7.36	0.26	28.7	+063	460	0.21	810	ND	6,700	11,000
South Profile										
D7-34	7.74	0.03	31.7	-100	8,700	0.11	1,600	0.2	4,000	8,200
D7-15	6.98	N.M.	29.3	-363	820	<0.020	1,300	ND	3,200	6,700
D7-33	7.04	0.22	29.7	-303	600	<0.020	1,300	ND	2,900	7,000
D7-51	6.97	0.00	27.7	-381	1,000	<0.020	1,300	ND	6,200	11,000

TABLE 4
INTRINSIC PARAMETER DATA
DISSOLVED PHASE INVESTIGATION - JUNE 1996
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

Well	pH	Dissolved Oxygen (mg/L)	Temperature (°C)	Oxidation Reduction Potential (mV)	Alkalinity (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Ferrous Iron (mg/L)	Chloride (mg/L)	Total Dissolved Solids (mg/L)
Background Wells										
C2-64	7.08	0.55	28.2	-062	1,000	0.030	990	0.5	6,300	11,000
I3-67	6.76	1.10	27.7	-078	360	0.65	100	ND	870	2,100
Additional Wells										
C3-65	7.46	0.15	28.8	+053	320	0.27	250	ND	1,000	2,000
B5-R08	7.33	0.19	28.8	-042	440	4.8	480	0.2	4,000	7,200
C6-R04	7.05	0.25	30.0	+054	520	0.14	220	ND	3,400	5,600
C6-58	6.82	0.31	28.8	-232	400	<0.020	470	ND	5,700	9,000
D8-48	6.92	0.34	27.9	-088	430	7.2	2,200	ND	5,100	10,000
C7-54	7.19	0.13	27.8	-110	320	0.075	1,400	ND	9,800	15,000
D8-50	7.40	0.35	27.8	+371	860	<0.020	1,500	ND	4,300	8,600

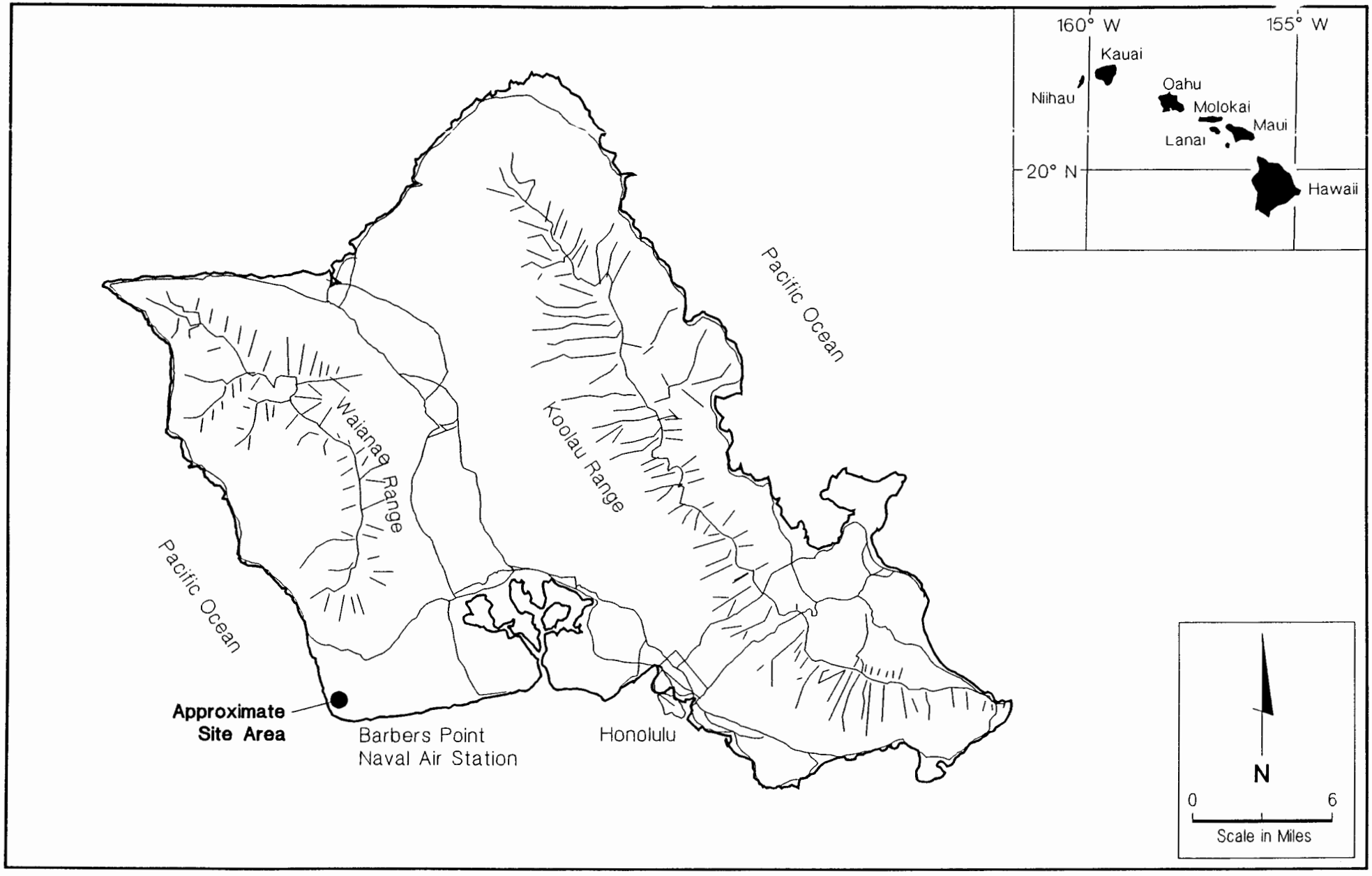
Notes:
mV = milli volts
N.M. = not measured
mg/L = milligrams per liter

TABLE 5
INTRINSIC BIODEGRADATION PARAMETERS
Offsite Parcels
Kapolei, Oahu, Hawaii

Location / Analyte	Units	G2-OWL016	J8-HWL006	K7-EWL004
Field Parameter				
pH		7.13	6.91	7.08
Electrical Conductivity	m℧/cm	1,560	1,530	3,630
Temperature	°C	27.7	29.3	28.3
Dissolved Oxygen	mg/L	3.45	0.22	4.63
Oxidation-Reduction Potential	mV	041	1595	102
Laboratory Parameters				
Bicarbonate Alkalinity	mg/L	450	550	550
Sulfate	mg/L	380	310	210
Nitrogen	mg/L	7.2	1.1	5.6
Ferrous Iron	mg/L	<0.1	<0.10	<0.10
Chloride	mg/L	2,200	1,800	1,200
Total Dissolved Solids	mg/L	4,400	4,400	3,200

Notes:
m℧/cm = micromho per centimeter
mV = milli volts
mg/L = milligrams per liter
°C = degrees centigrade

FIGURES



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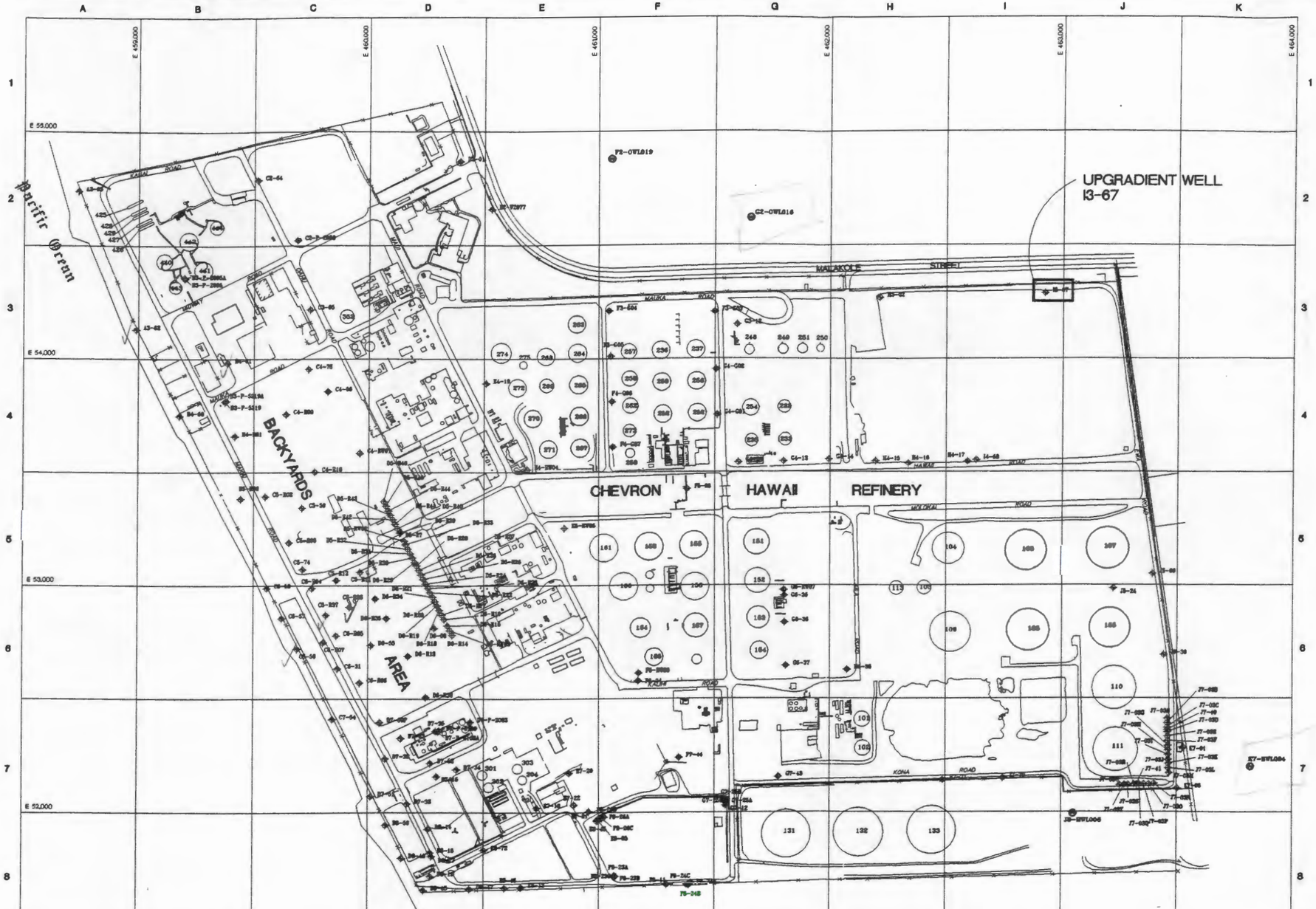
16000-543-5305 jsb 5305a.dwg 8/13/97

VICINITY MAP

Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

FIGURE 1



SITE MA
DISSOLVED PHASE INVESTIGATIO
Chevron Hawaii Refin
Kapolei, Oahu, Ha
FIGURE

DAMES & MOORE
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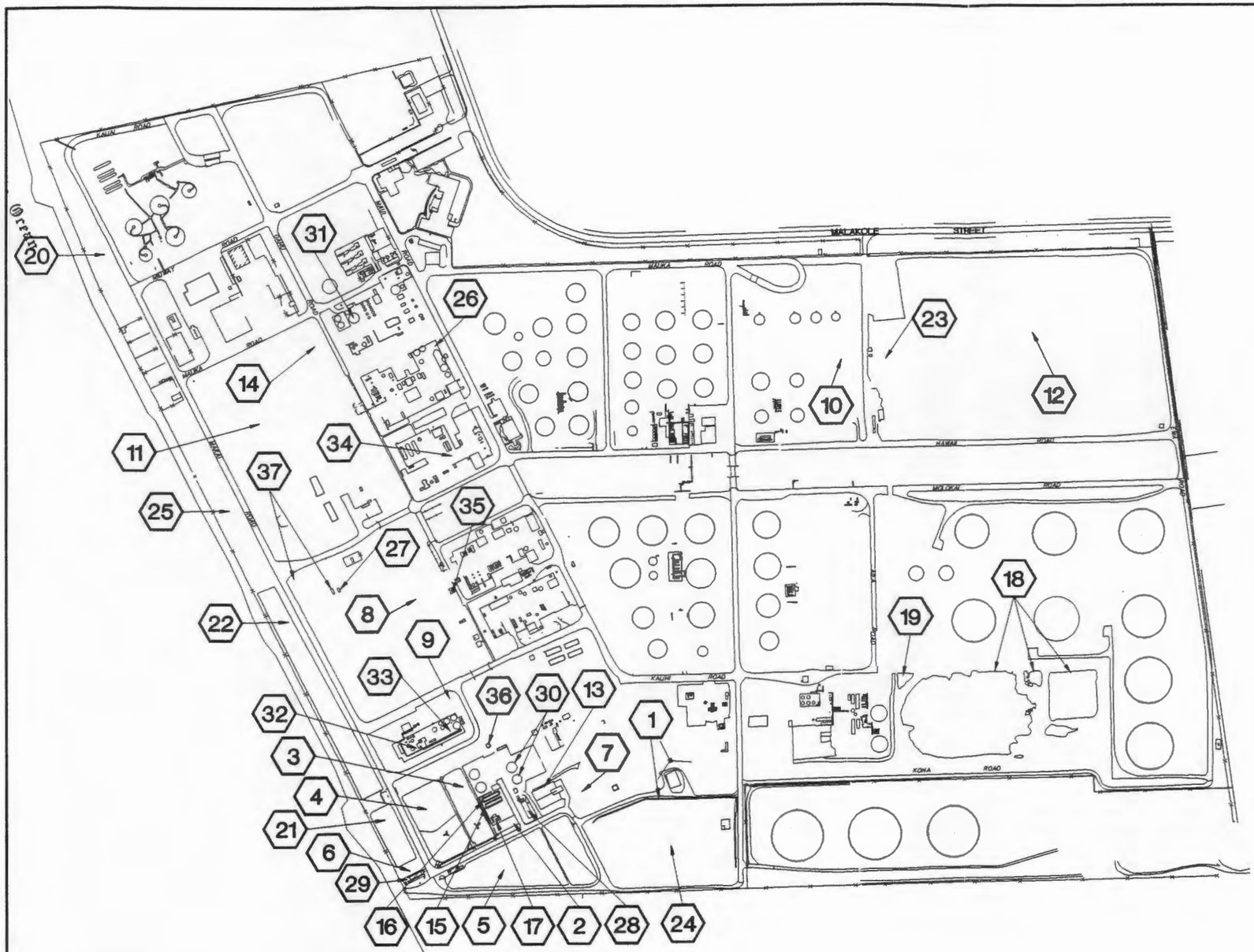
16000-542-5305 jsb 5305b 6/97



Explanation:

1. Landfarm
2. South Surge Pond
3. Oxidation Pond #1
4. Oxidation Ponds #2, #3
5. Impounding Basin
6. IAF (Algae) Pond
7. Flare Oily Basin
8. Clay Dewatering Impoundment
9. Amine Wash Water Impoundment
10. TEL Weathering Area
11. Landfill A
12. Landfill B
13. Flare Lime Basin
14. Sewer Sludge Impoundment
15. Neutralization Pond
16. Settling Basin
17. North Surge Pond
18. Crude Tank Area Impounding Basin
19. Tank Field Storm Water Pond
20. LPG Area Cooling Water Pond
21. South Ocean Pond
22. North Ocean Pond
23. Waste Pile A
24. Waste Pile B
25. Waste Pile C
26. FCC Catalyst Fines Hoppers
27. Empty Drum Storage Area
28. API Separator
29. IAF Unit
30. Foul/Sour Water Tanks
31. Foul Water Oxidizer
32. Weak Acid Neutralization Sump
33. Strong Acid Neutralization Sump
34. Alkylation Plant Neutralization Sump
35. Clay Dewatering Basin
36. Oil Recovery Box
37. MEK/Paint Pits

Note: Locations are approximate
Some units have been closed and may no longer be present.

N

0 500

Scale in Feet

Reference:
Engineering–Science, Inc.: Report
RCRA Facility Investigation
Chevron Hawaii Refinery
Barber's Point
Oahu, Hawaii
November 1993

Solid Waste Management Units Questionnaire
Chevron U.S.A. Inc.
Hawaiian Refinery
August 5, 1985

SOLID WASTE MANAGEMENT UNI
IDENTIFIED IN RCRA FACILITY INVESTIGATIO

Chevron Hawaii Refi
Kapolei, Oahu, Ha

FIGUR

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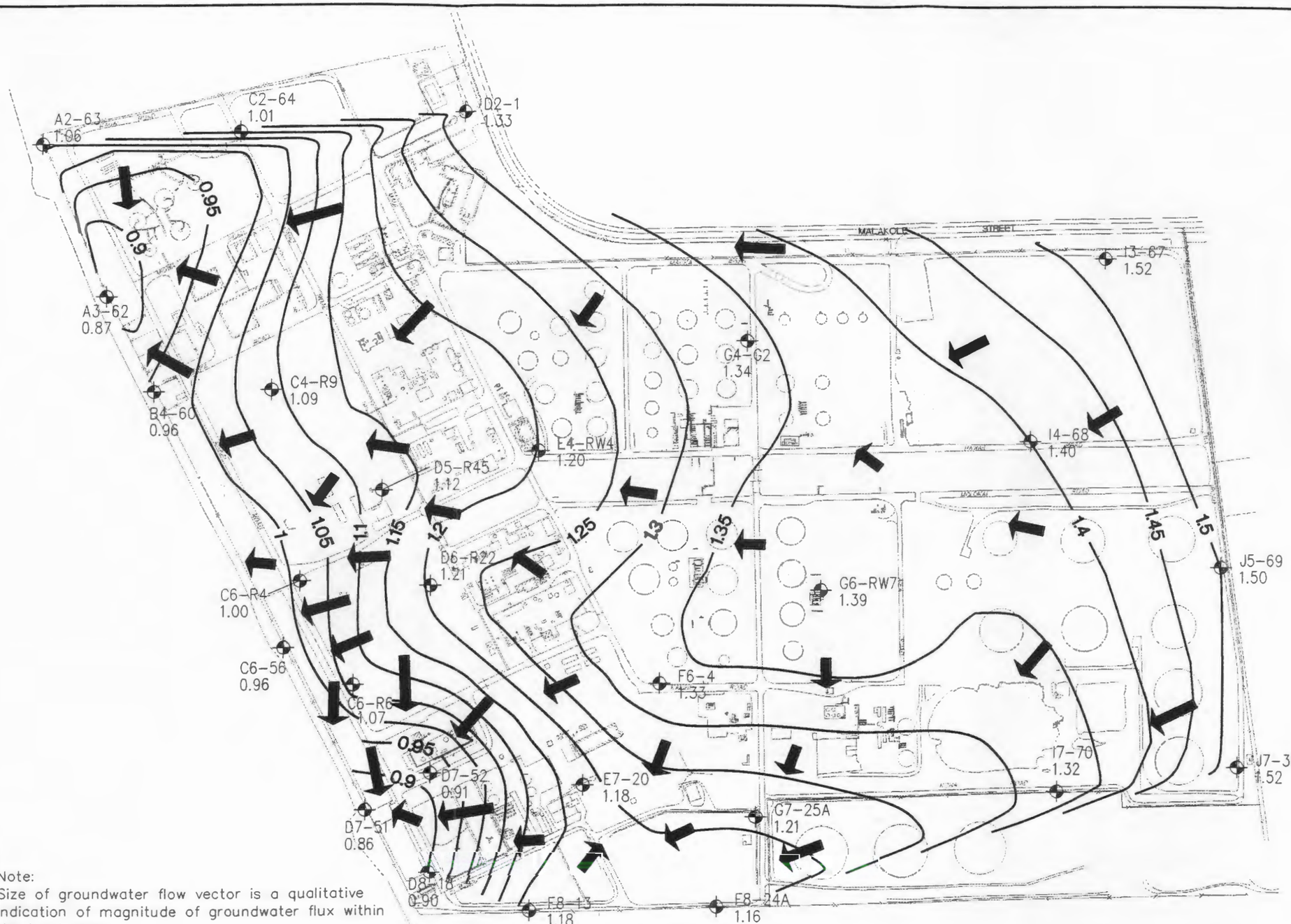

Figure Modified from Figure 13, Final report, Tidal study at the Chevron Hawaii Refinery, Dames and Moore; November 22, 1995
Data from July 10–11, 1995

AVERAGE POTENTIOMETRIC SURFAC AND GROUNDWATER FLOW DIRECTIO

Chevron Hawaii Refin
Kapolei, Oahu, Haw

FIGURE

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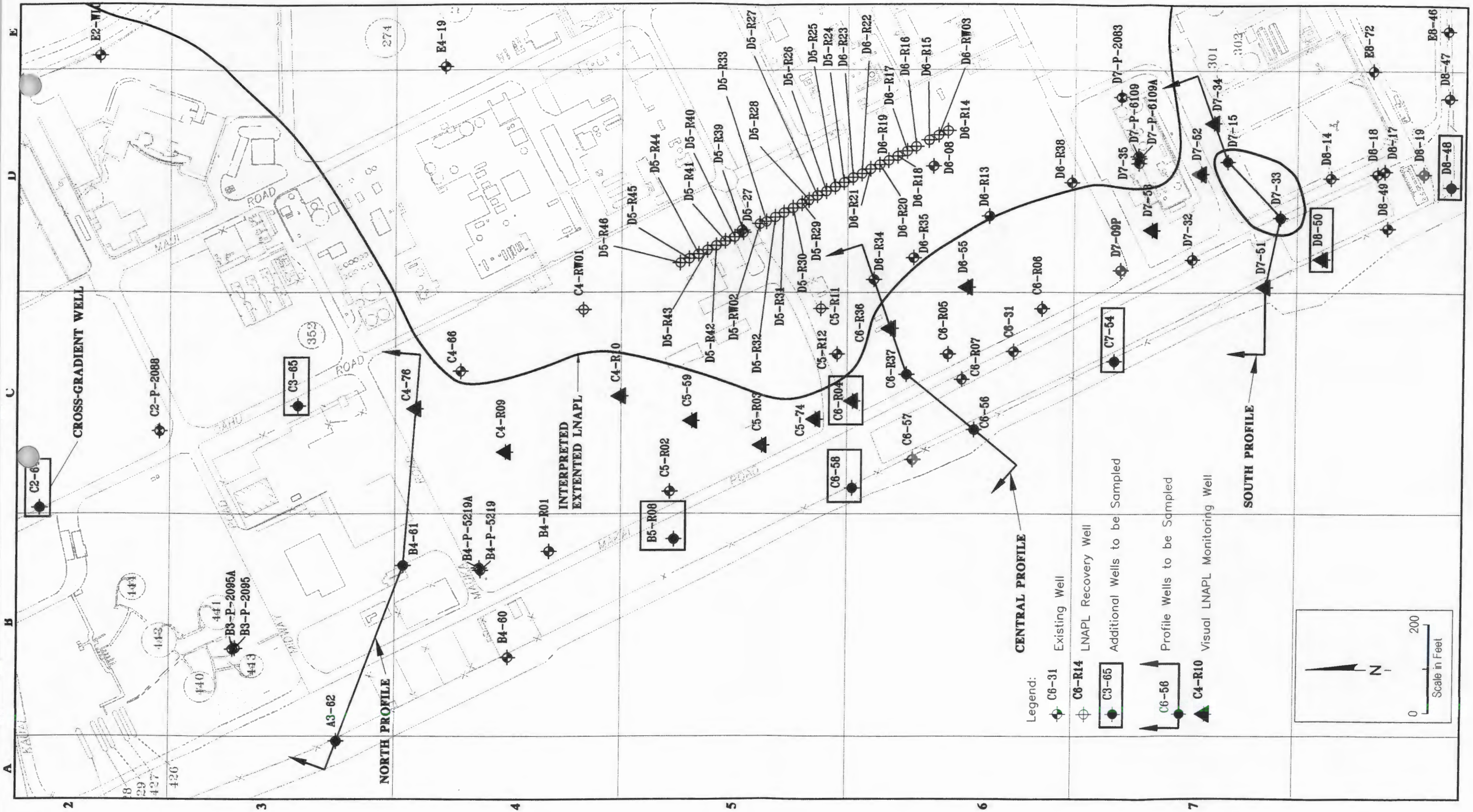

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BACKYARDS AREA
WELL LOCATIONS AND PROFILES

Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

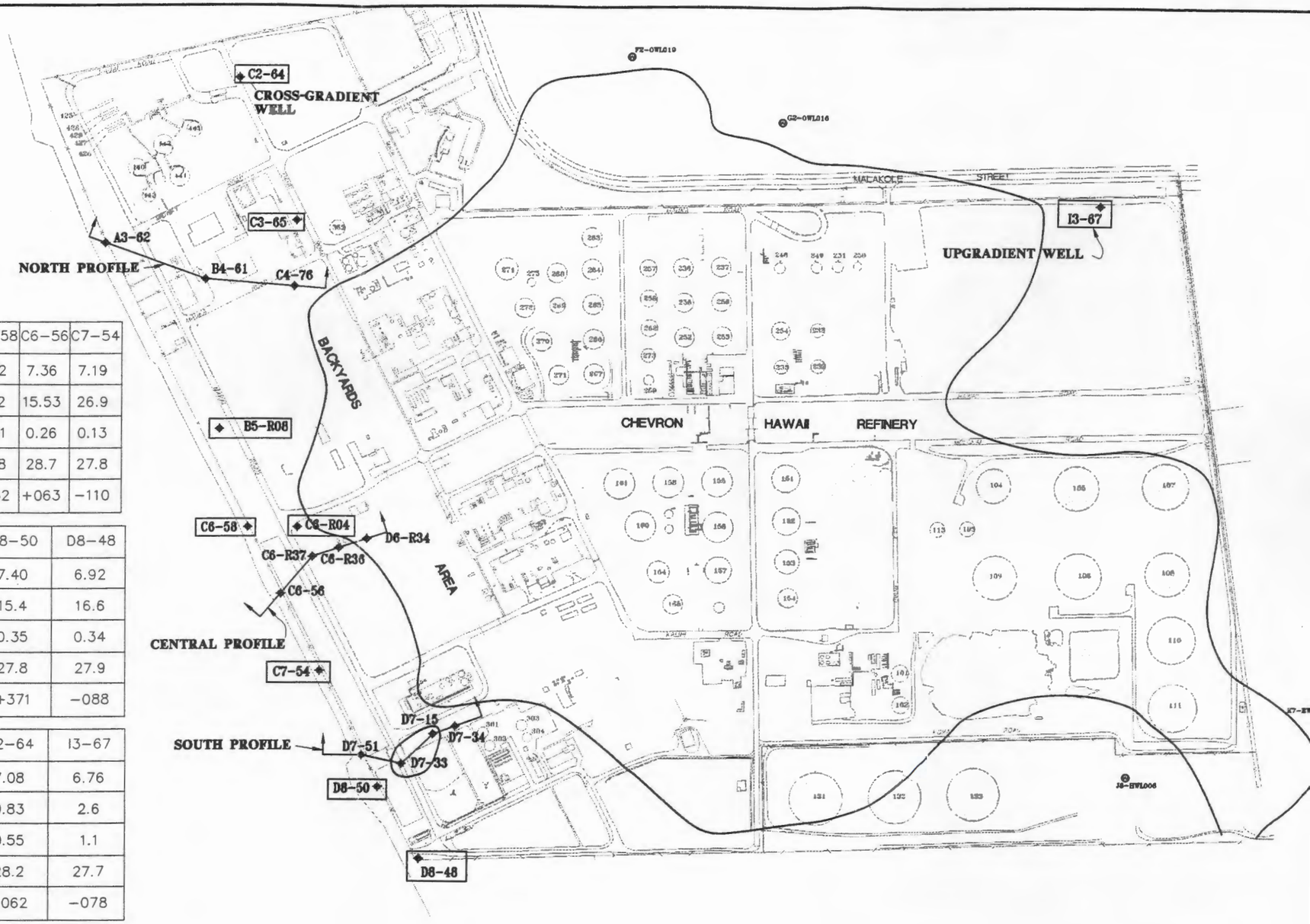
FIGURE 5

NORTHERN AREA	C3-65	C4-76	B4-61	A3-62
pH	7.46	7.9	6.89	7.42
Electrical Conductivity	4.56	4.25	2.73	15.49
Dissolved Oxygen	0.15	0.11	0.23	0.69
Temperature	28.8	30.1	32.4	27.4
Oxidation Reduction Potential	+053	-317	-078	+117

CENTRAL AREA	D6-R34	C6-R36	C6-R37	C6-R04	B5-R08	C6-58	C6-56	C7-54
pH	6.96	6.88	7.03	7.05	7.33	6.82	7.36	7.19
Electrical Conductivity	13.12	12.13	13.20	11.31	13.2	17.2	15.53	26.9
Dissolved Oxygen	0.38	0.08	0.09	0.25	0.19	0.31	0.26	0.13
Temperature	29.0	28.8	29.6	30.0	28.8	28.8	28.7	27.8
Oxidation Reduction Potential	-295	-027	-015	+054	-042	-232	+063	-110

SOUTHERN AREA	D7-34	D7-15	D7-33	D7-51	D8-50	D8-48
pH	7.74	6.98	7.04	6.97	7.40	6.92
Electrical Conductivity	1.8	12.6	2.3	19.6	15.4	16.6
Dissolved Oxygen	0.03	NM	0.22	0.00	0.35	0.34
Temperature	31.7	29.3	29.7	27.7	27.8	27.9
Oxidation Reduction Potential	-100	-363	-303	-381	+371	-088

BACKGROUND WELLS	C2-64	I3-67
pH	7.08	6.76
Electrical Conductivity	9.83	2.6
Dissolved Oxygen	0.55	1.1
Temperature	28.2	27.7
Oxidation Reduction Potential	-062	-078



N

0 470

Scale in Feet

Notes:

Units: pH = pH Units
Electrical Conductivity = 1,000 micromho per centimeter (m℧/cm)
Dissolved Oxygen = milligrams per liter (mg/L)
Temperature = degree centigrade
Oxidation-Reduction Potential = millivolts (mv)

Legend:

C6-31 Existing Well

C6-R14 LNAPL Recovery Well

C3-65 Additional Wells to be Sampled

C6-56 Profile Wells to be Sampled

C4-R10 Visual LNAPL Monitoring Well

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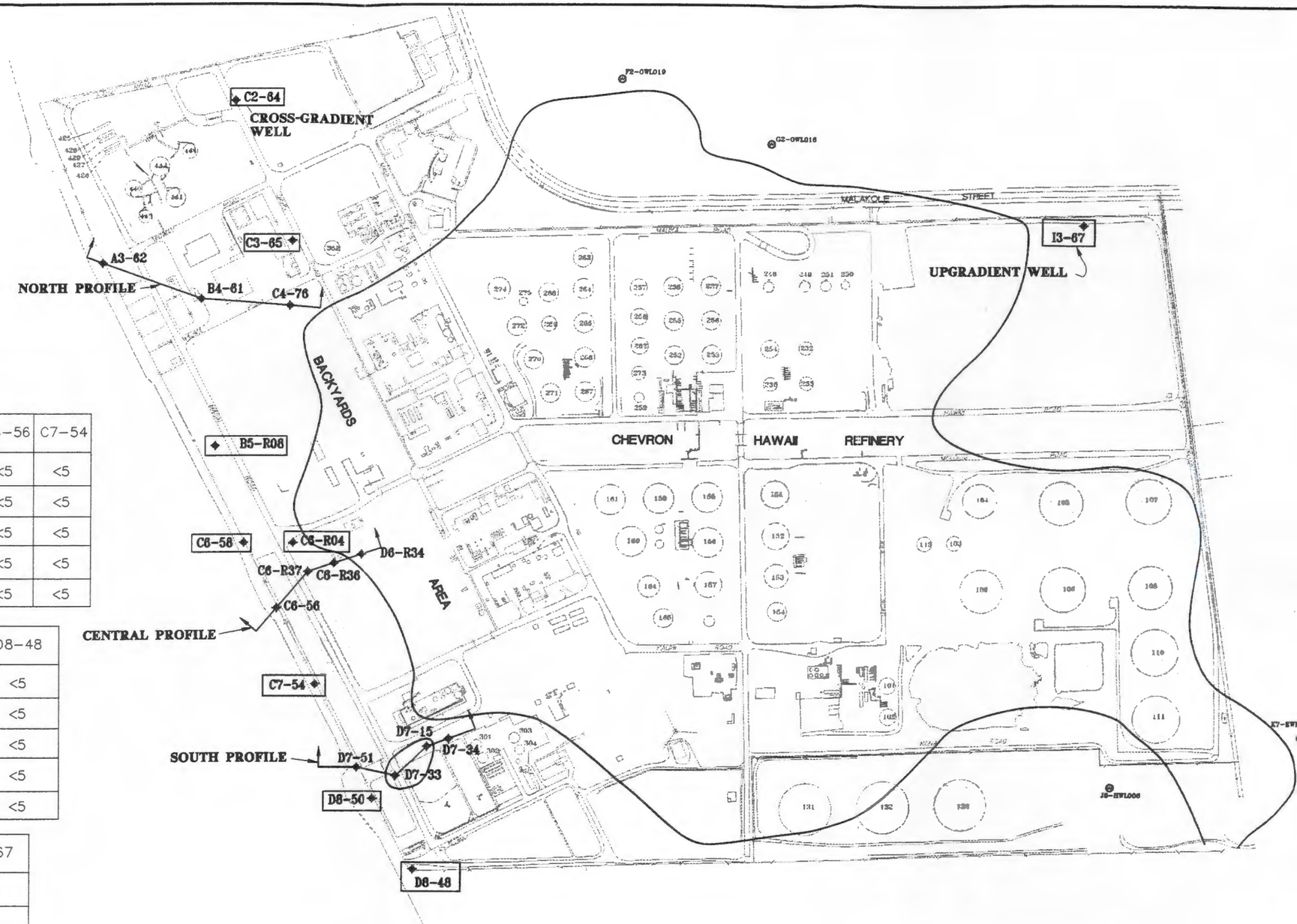
FIELD PARAMETER CONCENTRATION
DISSOLVED PHASE INVESTIGATIO
Chevron Hawaii Refin
Kapolei, Oahu, Haw
Figure

NORTHERN AREA	C3-65	C4-76	B4-61	A3-62
BENZENE	<5	<5	<5	<5
ETHYLBENZENE	<5	<5	<5	<5
M,P XYLENE	<5	<5	<5	<5
O XYLENE	<5	<5	<5	<5
TOLUENE	<5	<5	<5	<5

CENTRAL AREA	D6-R34	C6-R36	C6-R37	C6-R04	B5-R08	C6-58	C6-56	C7-54
BENZENE	<5	<5	<5	<5	<5.0	<5	<5	<5
ETHYLBENZENE	5.8	<5	<5	<5	<5.0	<5	<5	<5
M,P XYLENE	<5	<5	<5	<5	<5.0	<5	<5	<5
O XYLENE	<5	<5	<5	<5	<5.0	<5	<5	<5
TOLUENE	<5	<5	<5	<5	<5.0	<5	<5	<5

SOUTHERN AREA	D7-34	D7-15	D7-33	D7-51	D8-50	D8-48
BENZENE	<5	<5	<5	<5	<5	<5
ETHYLBENZENE	<5	54	9.5	<5	9.7	<5
M,P XYLENE	<5	180	140	<5	94	<5
O XYLENE	<5	120	19	14	37	<5
TOLUENE	<5	55	6.2	<5	12	<5



BACKGROUND WELLS	C2-64	I3-67
BENZENE	<5	<5
ETHYLBENZENE	<5	<5
M,P XYLENE	<5	<5
O XYLENE	<5	<5
TOLUENE	<5	<5

Note:

< Indicates Not Detected; At or Above Practical Quantitation Limits (PQL)

All Units Micrograms per Liter (ug/L)

Legend:

- C6-31 Existing Well
- C6-R14 LNAPL Recovery Well
- C3-65 Additional Wells to be Sampled
- C6-56 Profile Wells to be Sampled
- C4-R10 Visual LNAPL Monitoring Well

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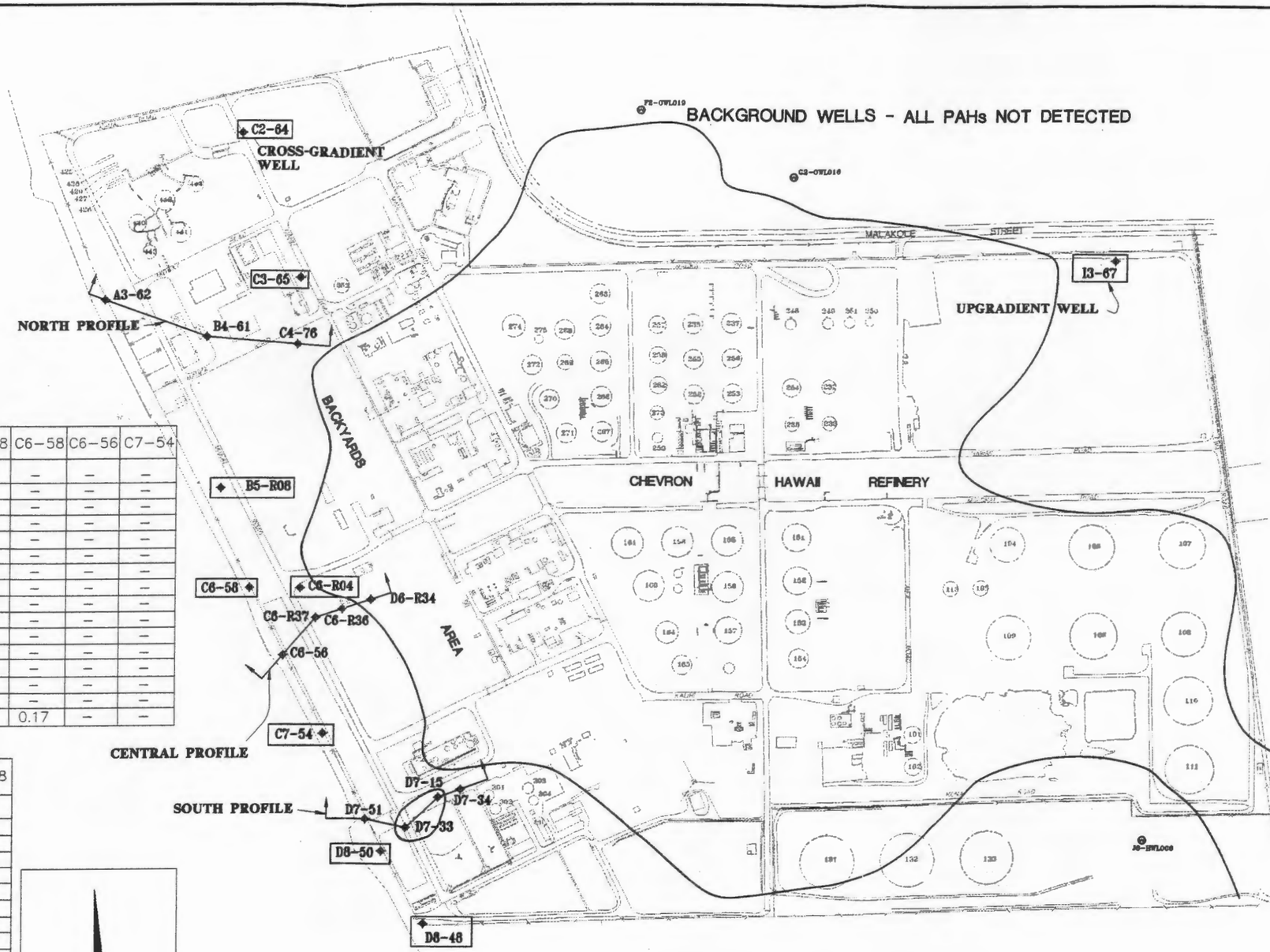
BTEX RESULT
DISSOLVED PHASE INVESTIGATIO
Chevron Hawaii Refine
Kapolei, Oahu, Haw
FIGURE

Note:
Concentrations Reported for PAHs Detected in Excess of Practical Quantitation Limits (PQLs)
All Units Micrograms Per Liter (ug/L)
– Indicates Not Detected At or Above PQLs
DUP = Duplicated Analysis Results

NORTHERN AREA	C3-65	C4-76/DUP	B4-61	A3-62
2-METHYLNAPHTHALENE	–	–	–	–
ACENAPHTHENE	–	12/9.8	–	–
ACENAPHTHYLENE	–	1.7/1.6	–	–
ANTHRACENE	–	0.58/ 0.35	–	–
BENZO(A)ANTHRACENE	–	–	–	–
BENZO(A)PYRENE	–	–	–	–
BENZO(B)FLUORANTHENE	–	–	–	–
BENZO(G,H,I)PERYLENE	–	–	–	–
CHRYSENE	–	–	–	–
DIBENZ(A,H)ANTHRACENE	–	–	–	–
FLUORANTHENE	–	–	–	–
FLUORENE	–	1.3/1.2	–	–
INDENO(1,2,3-CD)PYRENE	–	–	–	–
NAPHTHALENE	–	5/4.4	–	–
PHENANTHRENE	–	0.27/0.23	–	–
PYRENE	–	.17/0.16	–	–

CENTRAL AREA	D6-R34	C6-R36/DUP	C6-R37	C6-R04	B5-R08	C6-58	C6-56	C7-54
2-METHYLNAPHTHALENE	20	–	–	–	–	–	–	–
ACENAPHTHENE	2.9	–	–	–	–	–	–	–
ACENAPHTHYLENE	0.36	–	–	–	–	–	–	–
ANTHRACENE	0.22	–	–	–	–	–	–	–
BENZO(A)ANTHRACENE	–	–	–	–	–	–	–	–
BENZO(A)PYRENE	–	–	–	–	–	–	–	–
BENZO(B)FLUORANTHENE	–	–	–	–	–	–	–	–
BENZO(G,H,I)PERYLENE	–	–	–	–	–	–	–	–
CHRYSENE	0.26	–	–	–	–	–	–	–
DIBENZ(A,H)ANTHRACENE	–	–	–	–	–	–	–	–
FLUORANTHENE	–	–	–	–	–	–	–	–
FLUORENE	1.2	–	–	–	–	–	–	–
INDENO(1,2,3-CD)PYRENE	–	–	–	–	–	–	–	–
NAPHTHALENE	10	–	–	–	–	–	–	–
PHENANTHRENE	0.32	–	–	–	–	–	–	–
PYRENE	0.66	0.13/0.11	0.12	–	0.17	0.17	–	–

SOUTHERN AREA	D7-34	D7-15	D7-33	D7-51	D8-50	D8-48
2-METHYLNAPHTHALENE	–	–	–	–	15	–
ACENAPHTHENE	–	6.9	5.3	0.83	0.9	–
ACENAPHTHYLENE	–	2.8	1.8	0.15	0.26	–
ANTHRACENE	–	0.91	2.5	0.14	–	–
BENZO(A)ANTHRACENE	–	0.71	3.4	–	–	–
BENZO(A)PYRENE	–	0.59	4.4	–	–	–
BENZO(B)FLUORANTHENE	–	0.33	2.7	–	–	–
BENZO(G,H,I)PERYLENE	–	0.25	3.2	–	–	–
CHRYSENE	–	1.6	9	–	–	–
DIBENZ(A,H)ANTHRACENE	–	–	0.96	–	–	–
FLUORANTHENE	–	0.2	1.3	–	–	–
FLUORENE	–	8	5.3	0.8	1.1	–
INDENO(1,2,3-CD)PYRENE	–	–	0.84	–	–	–
NAPHTHALENE	–	460	3.5	–	1.5	–
PHENANTHRENE	–	15	4.1	0.21	0.38	–
PYRENE	–	1.9	9	0.11	–	–



Legend:

C6-31 Existing Well

C6-R14 LNAPL Recovery Well

C3-65 Additional Wells to be Sampled

C6-56 Profile Wells to be Sampled

C4-R10 Visual LNAPL Monitoring Well

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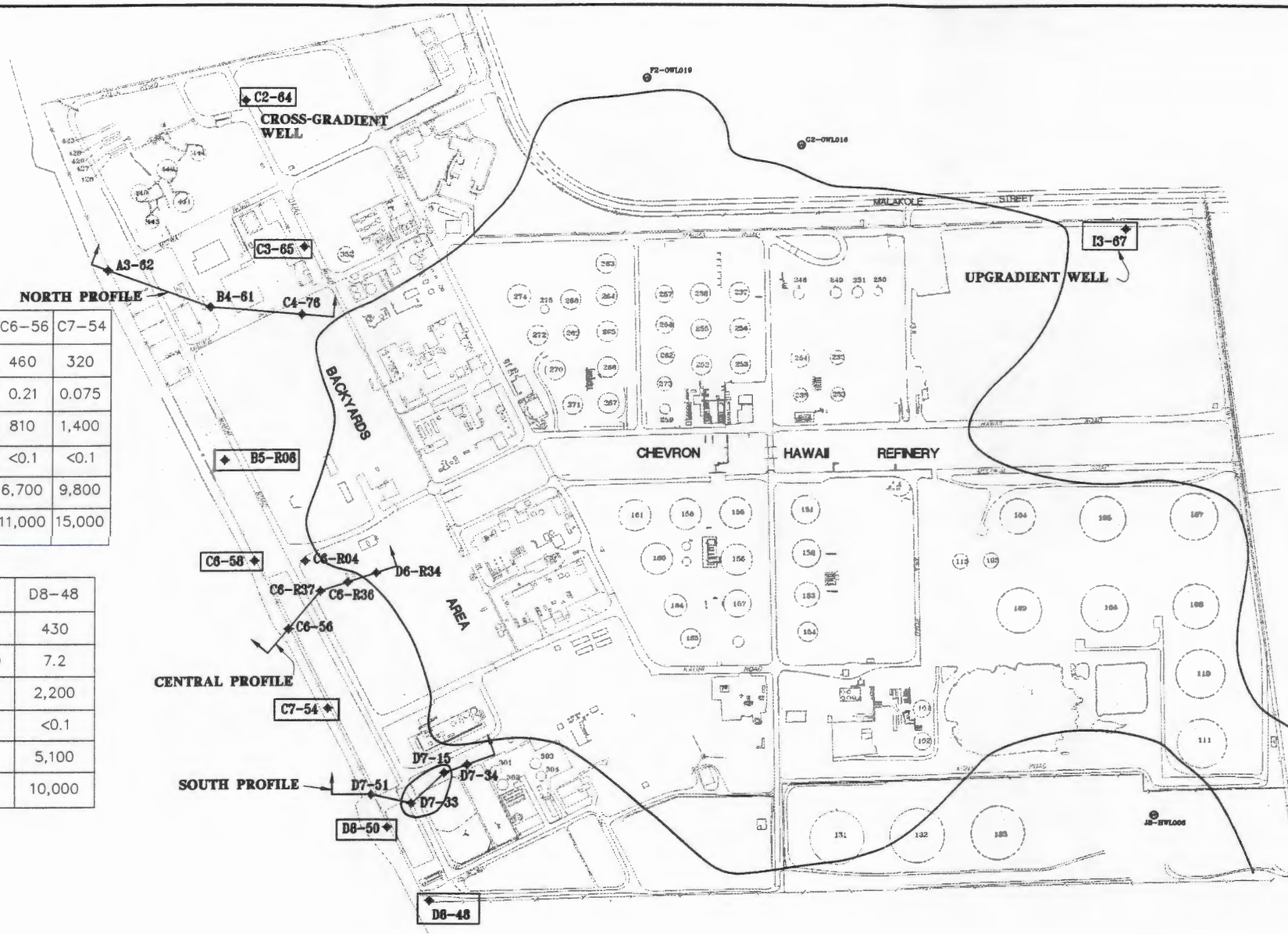
PAH RESULT
DISSOLVED PHASE INVESTIGATIO
Chevron Hawaii Refin
Kapolei, Oahu, Ha
FIGURE

NORTHERN AREA	C3-65	C4-76	B4-61	A3-62
Alkalinity	320	330	1,100	460
Nitrogen	0.27	0.14	0.020	0.21
Sulfate	250	120	180	730
Ferrous Iron	<0.1	<0.1	0.6	<0.1
Chloride	1,000	900	1,300	5,000
Total Dissolved Solids	2,000	2,400	3,100	8,900

CENTRAL AREA	D6-R34	C6-R36	C6-R37	C6-R04	B5-R08	C6-58	C6-56	C7-54
Alkalinity	720	570	560	520	440	400	460	320
Nitrogen	0.030	0.042	0.070	0.14	4.8	<0.020	0.21	0.075
Sulfate	11	200	270	220	480	470	810	1,400
Ferrous Iron	0.8	1.4	0.7	<0.1	0.2	<0.1	<0.1	<0.1
Chloride	1,600	3,700	4,600	3,400	4,000	5,700	6,700	9,800
Total Dissolved Solids	3,200	5,800	6,900	5,600	7,200	9,000	11,000	15,000

SOUTHERN AREA	D7-34	D7-15	D7-33	D7-51	D8-50	D8-48
Alkalinity	8,700	820	600	1,000	860	430
Nitrogen	0.11	<0.020	<0.020	<0.020	<0.020	7.2
Sulfate	1,600	1,300	1,300	1,300	1,500	2,200
Ferrous Iron	0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Chloride	4,000	3,200	2,900	6,200	4,300	5,100
Total Dissolved Solids	8,200	6,700	7,000	11,000	8,600	10,000

BACKGROUND WELLS	C2-64	I3-67
Alkalinity	1,000	360
Nitrogen	0.030	0.65
Sulfate	990	100
Ferrous Iron	0.5	<0.1
Chloride	6,300	870
Total Dissolved Solids	11,000	2,100



All concentrations in milligrams per liter (mg/L)
< indicates concentration below detection limit indicated

Legend:

- C6-31 Existing Well
- C6-R14 LNAPL Recovery Well
- C3-65 Additional Wells to be Sampled
- C6-56 Profile Wells to be Sampled
- C4-R10 Visual LNAPL Monitoring Well

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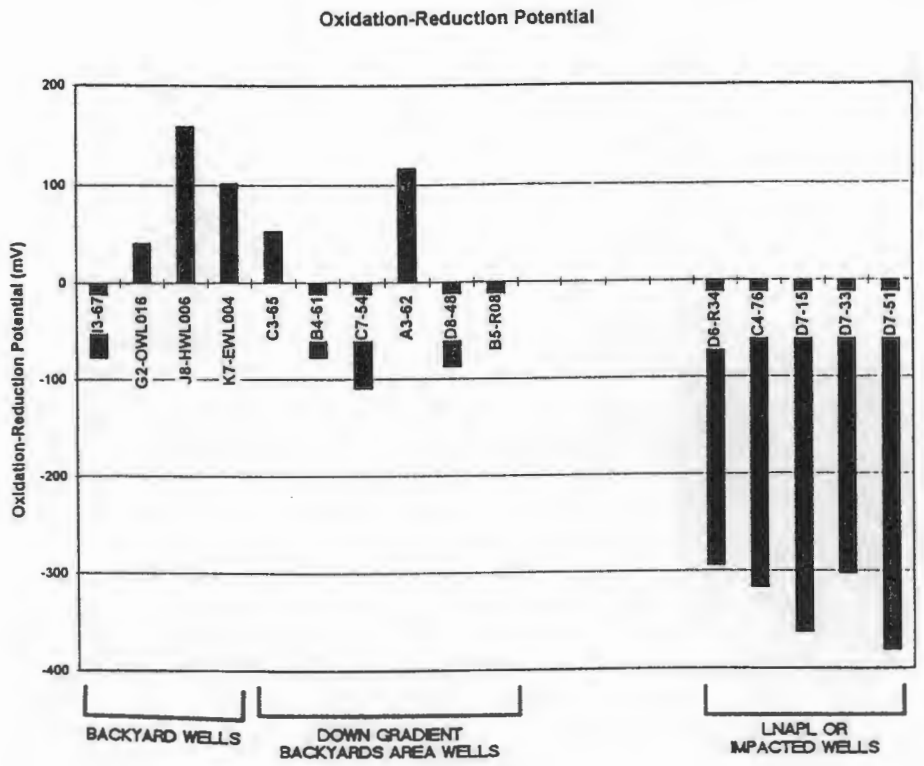
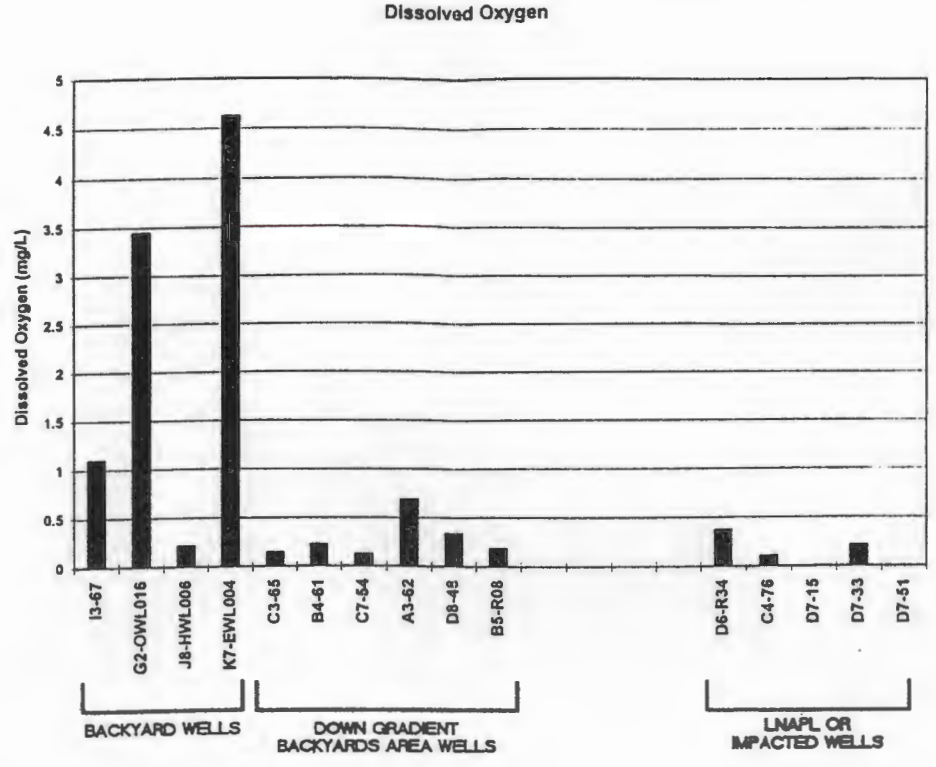
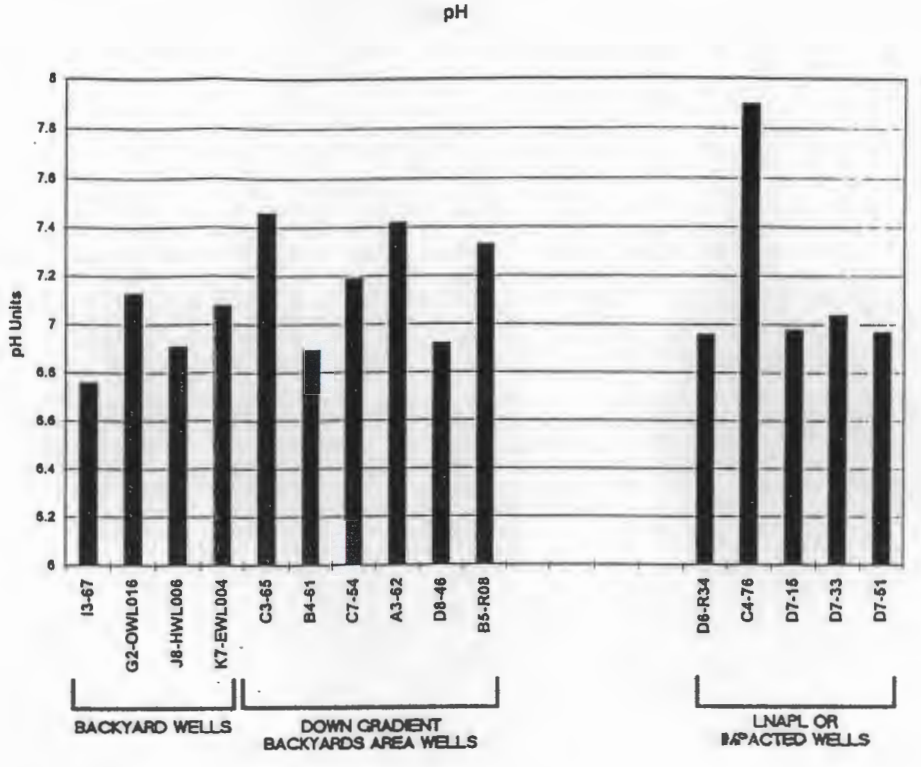
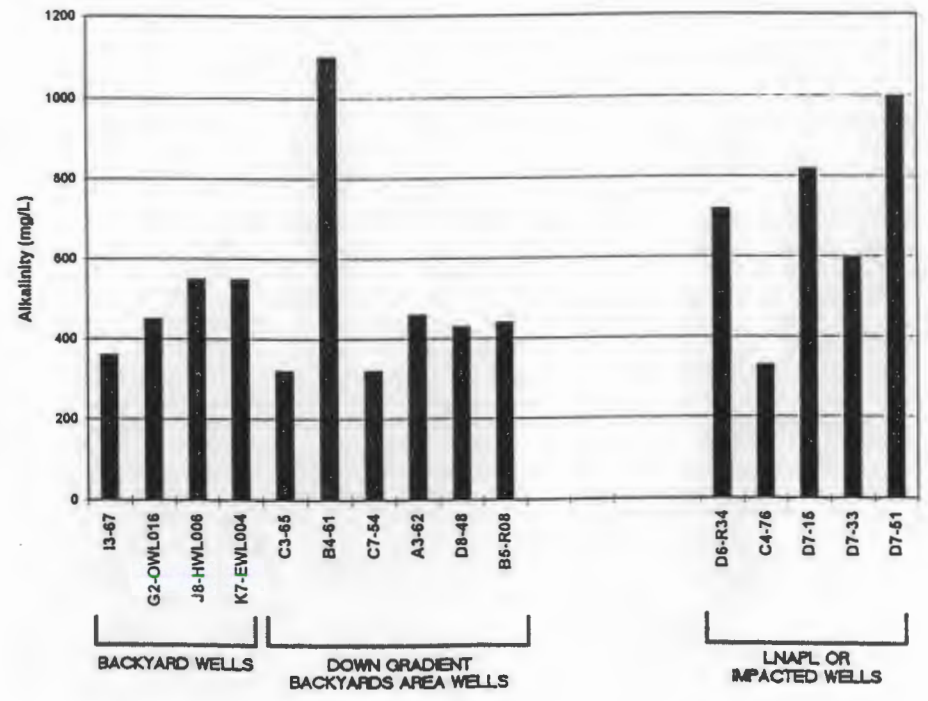
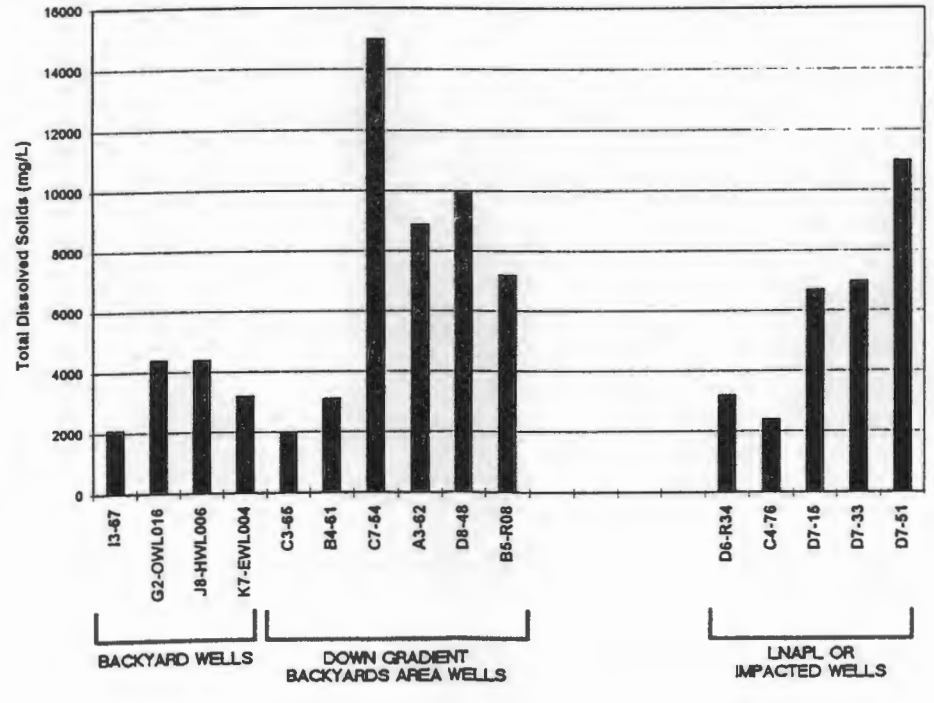
INORGANIC CONSTITUENT CONCENTRATION
DISSOLVED PHASE INVESTIGATIO
Chevron Hawaii Refine
Kapolei, Oahu, Haw
FIGURE

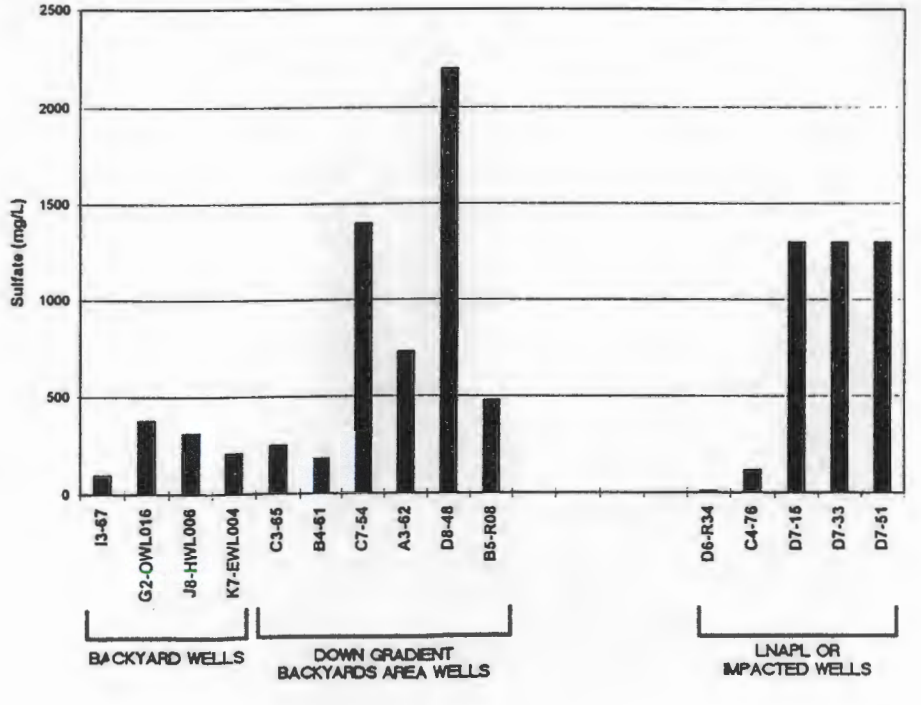












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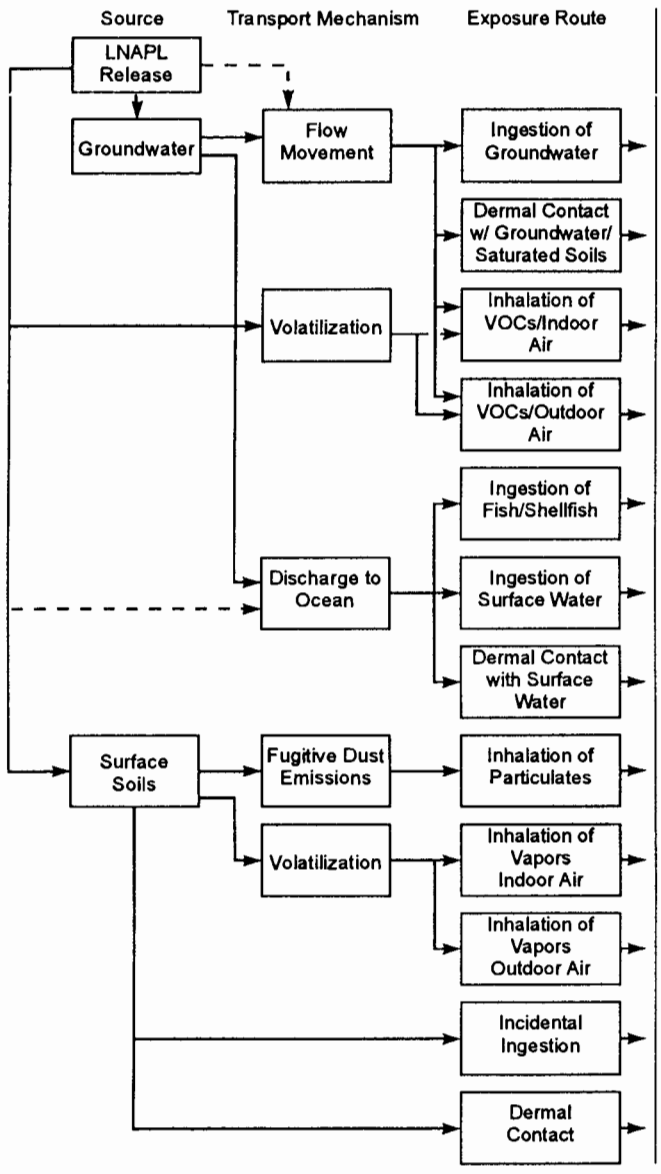
011:16000-543-6035 jsb 5305L.dwg 8/13/97

INTRINSIC BIODEGRADATIO
PARAMETER CONCENTRATION
Hawaiian Electric Company Pa
Kapolei, Oahu, Ha
FIGURE



	Current Conditions			Future Conditions			
	On-site Worker	Off-site Worker	Recreational User	On-site Worker	Off-site Worker	Construction Worker	Pacific Ocean Recreational User
Ingestion of Groundwater	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete
Dermal Contact w/ Groundwater/ Saturated Soils	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Complete	Incomplete
Inhalation of VOCs/Indoor Air	Insignificant	Incomplete	Incomplete	Complete	Incomplete	Incomplete	Incomplete
Inhalation of VOCs/Outdoor Air	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant
Ingestion of Fish/Shellfish	Incomplete	Incomplete	Incomplete (L) Insignificant (D)	Incomplete	Incomplete	Incomplete	Complete* (L,D)
Ingestion of Surface Water	Incomplete	Incomplete	Incomplete (L) Insignificant (D)	Incomplete	Incomplete	Incomplete	Complete* (L,D)
Dermal Contact with Surface Water	Incomplete	Incomplete	Incomplete (L) Insignificant (D)	Incomplete	Incomplete	Incomplete	Complete* (L,D)
Inhalation of Particulates	Incomplete	Incomplete	Incomplete	Insignificant	Incomplete	Complete	Incomplete
Inhalation of Vapors Indoor Air	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete
Inhalation of Vapors Outdoor Air	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant
Incidental Ingestion	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Complete	Incomplete
Dermal Contact	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Complete	Incomplete

NOTES

- — — Hypothetical transport; Plume appears stable.
- * Contingent upon migration of plume.
- (L) = LNAPL Phase
- (D) = Dissolved Phase

"Insignificant" refers to complete exposure pathways that are not expected to significantly contribute to overall site risks.

CONCEPTUAL SITE MODEL FOR HUMAN RECEPTORS

Backyards Area Refined CSM
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

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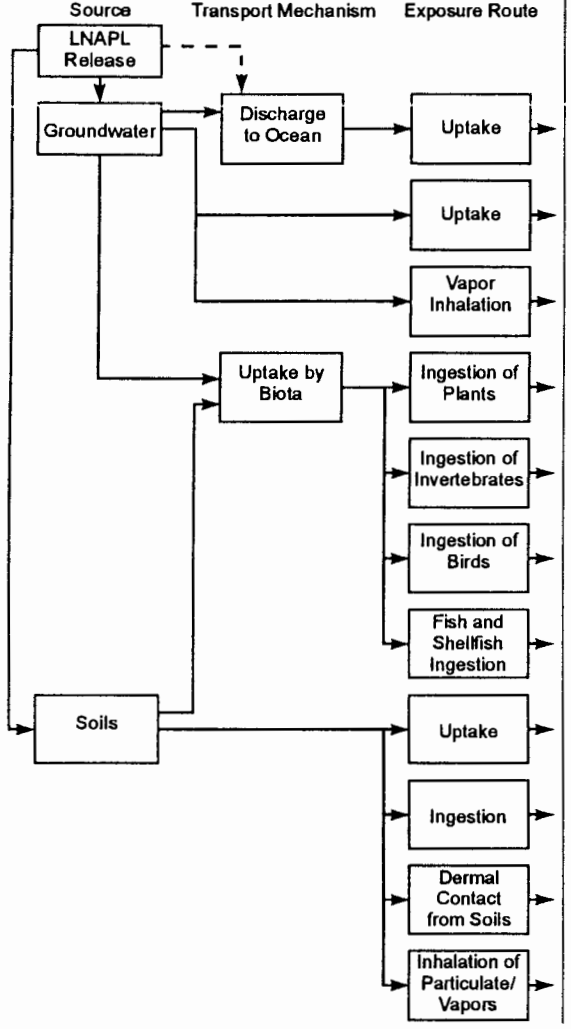
A DAMES & MOORE GROUP COMPANY

16000-542-5405-158 ah 5405B_B 6/23/97

FIGURE 11



	Current Conditions				Future Conditions			
	Aquatic Organisms	Terrestrial Plants	Terrestrial Birds	Terrestrial Mammals[1]	Aquatic Organisms	Terrestrial Plants	Terrestrial Birds	Terrestrial Mammals[1]
Groundwater → Discharge to Ocean → Uptake	Incomplete (L) Insignificant (D)	Incomplete	-	-	Complete(L)* Insignificant(D)	-	-	-
Groundwater → Uptake	Incomplete	Incomplete	-	-	Insignificant(D)	Insignificant	-	-
Groundwater → Vapor Inhalation	-	-	Insignificant	Insignificant	-	-	Insignificant	Insignificant
Groundwater → Uptake by Biota → Ingestion of Plants	Incomplete	-	Incomplete	Incomplete	Complete(L)* Insignificant(D)	-	Insignificant	Incomplete
Groundwater → Uptake by Biota → Ingestion of Invertebrates	Incomplete	-	Insignificant	Insignificant	Complete(L)* Insignificant(D)	-	Insignificant	Incomplete
Groundwater → Uptake by Biota → Ingestion of Birds	-	-	Incomplete	Insignificant	-	-	Insignificant	Insignificant
Groundwater → Uptake by Biota → Fish and Shellfish Ingestion	Incomplete	-	Incomplete	Incomplete	Complete(L,D)*(Pr)	-	Insignificant(D)	Incomplete
Soils → Uptake	-	Incomplete	-	-	-	Insignificant	-	-
Soils → Ingestion	-	-	Insignificant	Insignificant	-	-	Insignificant	Insignificant
Soils → Dermal Contact from Soils	-	-	Insignificant	Insignificant	-	-	Insignificant	Insignificant
Soils → Inhalation of Particulate/ Vapors	-	-	Insignificant	Insignificant	-	-	Insignificant	Insignificant

NOTES

- - - Hypothetical transport; Plume appears stable.

"Insignificant" refers to complete exposure pathways that are not expected to significantly contribute to overall site risks.

(1) Mongoose is the only mammalian wildlife.

* Contingent upon migration of plume.

(L) LNAPL phase.

(D) Dissolved phase.

(Pr) Predator (e.g. Pelagic birds & shore birds; aquatic organisms feeding high on the food chain)

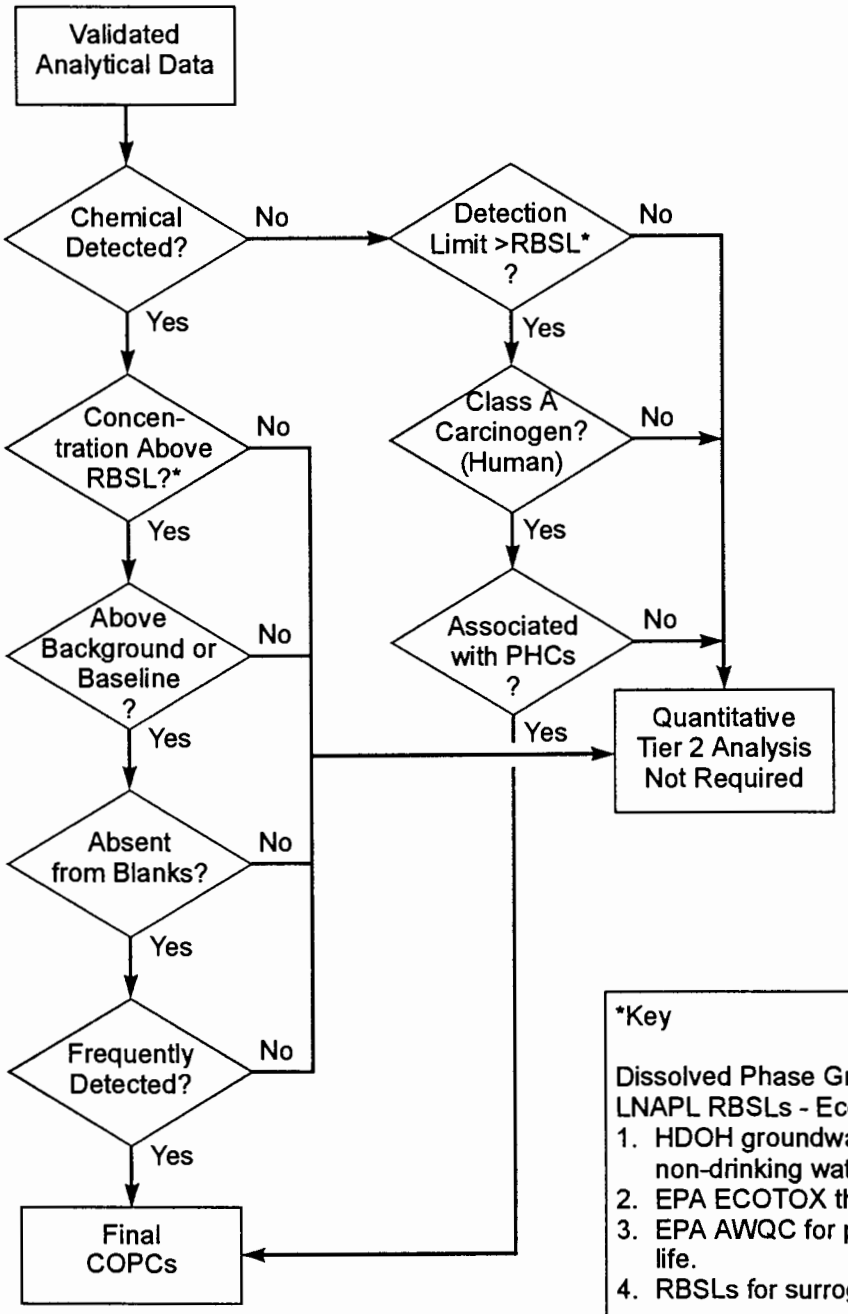
CONCEPTUAL SITE MODEL FOR ECOLOGICAL RECEPTORS

Backyards Area Refined CSM
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

DAMES & MOORE
A DAMES & MOORE GROUP COMPANY

16000-542-5405-158 maj A5405A_A 8/11/97

FIGURE 12



*Key

Dissolved Phase Groundwater and LNAPL RBSLs - Ecological:
1. HDOH groundwater action levels - non-drinking water.
2. EPA ECOTOX thresholds.
3. EPA AWQC for protection of aquatic life.
4. RBSLs for surrogate chemicals.

Dissolved Phase Groundwater and LNAPL RBSLs - Human Health:
1. HDOH groundwater action levels.
2. Human health AWQC for fish ingestion.
3. EPA Region IX tap water PRGs.
4. RBSLs for surrogate chemicals.

AWQC = Ambient Water Quality Criteria
COPC = Chemical of Potential Concern
HDOH = Hawaii Department of Health
PHCs = Petroleum Hydrocarbon
PRG = Preliminary Remedial Goal
RBSL = Risk-based Screening Level

FINAL COPC SELECTION PROCESS

Backyards Area Refined CSM
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

APPENDIX A

APPENDIX A
SUMMARY OF ANALYTICAL RESULTS

ANALYTICAL RESULTS - VOLATILES
DISSOLVED PHASE INVESTIGATION - JUNE 1996
CHEVRON HAWAII REFINERY

		NORTH PROFILE								CENTRAL PROFILE				
	LOCATION	C3-65		C4-76		C4-76		B4-61	A3-62	D6-R34		C6-R36	C6-R36	
	DATE	06/24/96		06/24/96		06/24/96		06/21/96	06/20/96	06/21/96		06/21/96	06/21/96	
	QA					DUPLICATE							DUPLICATE	
ANALYTE	UNITS													
1-TRICHLOROETHANE	ug/L	<5		<5		<5		--	--	<5		--	--	
1,2-TETRACHLOROETHANE	ug/L	<5		<5		<5		--	--	<5		--	--	
2-TRICHLOROETHANE	ug/L	<5		<5		<5		--	--	<5		--	--	
DICHLOROETHANE	ug/L	<5		2.2	J|JQ	2.1	J|JQ	--	--	<5		--	--	
DICHLOROETHENE	ug/L	<5		<5		<5		--	--	<5		--	--	
DICHLOROETHANE	ug/L	<5		<5		<5		--	--	<5		--	--	
DICHLOROPROPANE	ug/L	<5		<5		<5		--	--	<5		--	--	
JTANONE	ug/L	<10		<10		<10		--	--	<10		--	--	
ILOROETHYLVINYLETHER	ug/L	<20		<20		<20		--	--	<20		--	--	
EXANONE	ug/L	<10		<10		<10		--	--	<10		--	--	
ETHYL-2-PENTANONE	ug/L	<10		<10		<10		--	--	<10		--	--	
TONE	ug/L	<10		7.9	J|Uz	4.3	J|Uz	--	--	4.8	JB|Uz	--	--	
ZENE	ug/L	<5		<5		<5		<5	<5	<5		<5	<5	
MODICHLOROMETHANE	ug/L	<5		<5		<5		--	--	<5		--	--	
MOFORM	ug/L	<5		<5		<5		--	--	<5		--	--	
MOMETHANE	ug/L	<5		<5		<5		--	--	<5		--	--	
BON DISULFIDE	ug/L	<5		<5		<5		--	--	2.2	J|JQ	--	--	
BON TETRACHLORIDE	ug/L	<5		<5		<5		--	--	<5		--	--	
OROBENZENE	ug/L	<5		<5		<5		--	--	<5		--	--	
OROETHANE	ug/L	<5		<5		<5		--	--	<5		--	--	
OROFORM	ug/L	<5		<5		<5		--	--	<5		--	--	
OROMETHANE	ug/L	<5		<5		<5		--	--	<5		--	--	
1,2-DICHLOROETHENE	ug/L	<5		<5		<5		--	--	<5		--	--	
1,3-DICHLOROPROPENE	ug/L	<5		<5		<5		--	--	<5		--	--	
ROMOCHLOROMETHANE	ug/L	<5		<5		<5		--	--	<5		--	--	
YLBENZENE	ug/L	<5		1.4	J|JQ	1.3	J|JQ	<5	<5	5.8		<5	<5	
XYLENE	ug/L	<5		<5		<5		<5	<5	<5		<5	<5	
HYLENE CHLORIDE	ug/L	<5		<5		<5		--	--	<5		--	--	
LENE	ug/L	<5		2.6	J|JQ	2.1	J|JQ	<5	<5	<5		<5	<5	
RENE	ug/L	<5		<5		<5		--	--	<5		--	--	
RACHLOROETHENE	ug/L	<5		<5		<5		--	--	<5		--	--	
UENE	ug/L	<5		<5		<5		<5	<5	<5		<5	<5	
NS-1,2-DICHLOROETHENE	ug/L	<5		<5		<5		--	--	<5		--	--	
NS-1,3-DICHLOROPROPENE	ug/L	<5		<5		<5		--	--	<5		--	--	
HLOROETHENE	ug/L	<5		<5		<5		--	--	<5		--	--	
HLOROFLUOROMETHANE	ug/L	<5		<5		<5		--	--	<5		--	--	
L ACETATE	ug/L	<10		<10		<10		--	--	<10		--	--	
L CHLORIDE	ug/L	<5		<5		<5		--	--	<5		--	--	
ICHLOROBENZENE	ug/L	<5		<5		<5		--	--	<5		--	--	
ICHLOROBENZENE	ug/L	<5		<5		<5		--	--	<5		--	--	
ICHLOROBENZENE	ug/L	<5		<5		<5		--	--	<5		--	--	

ANALYTICAL RESULTS - VOLATILES
DISSOLVED PHASE INVESTIGATION - JUNE 1996
CHEVRON HAWAII REFINERY

		CENTRAL PROFILE		CENTRAL - ADDITIONAL WELLS				SOUTH
LOCATION		C6-R37	C6-56	C6-R04	B5-R08	C6-58	C7-54	D7-34
DATE		06/20/96	06/20/96	06/21/96	06/24/96	06/20/96	06/20/96	06/21/96
QA								
ANALYTE	UNITS							
1,1,1-TRICHLOROETHANE	ug/L	--	--	<5	<5.0	--	<5	<5
1,1,2,2-TETRACHLOROETHANE	ug/L	--	--	<5	<5.0	--	<5	<5
1,1,2-TRICHLOROETHANE	ug/L	--	--	<5	<5.0	--	<5	<5
1,1-DICHLOROETHANE	ug/L	--	--	<5	<5.0	--	<5	<5
1,1-DICHLOROETHENE	ug/L	--	--	<5	<5.0	--	<5	<5
1,2-DICHLOROETHANE	ug/L	--	--	<5	<5.0	--	<5	<5
1,2-DICHLOROPROPANE	ug/L	--	--	<5	<5.0	--	<5	<5
2-BUTANONE	ug/L	--	--	<10	<10.	--	<10	<10
2-CHLOROETHYLVINYLETHER	ug/L	--	--	<20	<20.	--	<20	<20
2-HEXANONE	ug/L	--	--	<10	<10.	--	<10	<10
4-METHYL-2-PENTANONE	ug/L	--	--	<10	<10.	--	<10	<10
ACETONE	ug/L	--	--	<10	<10.	--	4.1 JB|Uz	<10
BENZENE	ug/L	<5	<5	<5	<5.0	<5	<5	<5
BROMODICHLOROMETHANE	ug/L	--	--	<5	<5.0	--	<5	<5
BROMOFORM	ug/L	--	--	<5	<5.0	--	<5	<5
BROMOMETHANE	ug/L	--	--	<5	<5.0	--	<5	<5
CARBON DISULFIDE	ug/L	--	--	<5	<5.0	--	<5	<5
CARBON TETRACHLORIDE	ug/L	--	--	<5	<5.0	--	<5	<5
CHLOROBENZENE	ug/L	--	--	<5	<5.0	--	<5	<5
CHLOROETHANE	ug/L	--	--	<5	<5.0	--	<5	<5
CHLOROFORM	ug/L	--	--	<5	<5.0	--	<5	<5
CHLOROMETHANE	ug/L	--	--	<5	<5.0	--	<5	<5
CIS-1,2-DICHLOROETHENE	ug/L	--	--	<5	<5.0	--	<5	<5
CIS-1,3-DICHLOROPROPENE	ug/L	--	--	<5	<5.0	--	<5	<5
DIBROMOCHLOROMETHANE	ug/L	--	--	<5	<5.0	--	<5	<5
ETHYLBENZENE	ug/L	<5	<5	<5	<5.0	<5	<5	<5
M,P-XYLENE	ug/L	<5	<5	<5	<5.0	<5	<5	<5
METHYLENE CHLORIDE	ug/L	--	--	<5	<5.0	--	<5	<5
O-XYLENE	ug/L	<5	<5	<5	<5.0	<5	<5	<5
STYRENE	ug/L	--	--	<5	<5.0	--	<5	<5
TETRACHLOROETHENE	ug/L	--	--	<5	<5.0	--	<5	<5
TOLUENE	ug/L	<5	<5	<5	<5.0	<5	<5	<5
TRANS-1,2-DICHLOROETHENE	ug/L	--	--	<5	<5.0	--	<5	<5
TRANS-1,3-DICHLOROPROPENE	ug/L	--	--	<5	<5.0	--	<5	<5
TRICHLOROETHENE	ug/L	--	--	<5	<5.0	--	<5	<5
TRICHLOROFLUOROMETHANE	ug/L	--	--	<5	<5.0	--	<5	<5
VINYL ACETATE	ug/L	--	--	<10	<10.	--	<10	<10
VINYL CHLORIDE	ug/L	--	--	<5	<5.0	--	<5	<5
1,2-DICHLOROBENZENE	ug/L	--	--	<5	<5.0	--	<5	<5
1,3-DICHLOROBENZENE	ug/L	--	--	<5	<5.0	--	<5	<5
1,4-DICHLOROBENZENE	ug/L	--	--	<5	<5.0	--	<5	<5

ANALYTICAL RESULTS - VOLATILES
DISSOLVED PHASE INVESTIGATION - JUNE 1996
CHEVRON HAWAII REFINERY

		SOUTH PROFILE						SOUTH - ADDITIONAL WELLS				BACKROUND WELLS			
	LOCATION	D7-15		D7-33		D7-51		D8-50		D8-48		I3-67		C2-64	
	DATE	06/21/96		06/20/96		06/20/96		06/20/96		06/20/96		06/21/96		06/20/96	
	QA														
ANALYTE	UNITS														
1,1,1-TRICHLOROETHANE	ug/L	--		--		--		<5		<5		<5		<5	
1,1,2,2-TETRACHLOROETHANE	ug/L	--		--		--		<5		<5		<5		<5	
1,1,2-TRICHLOROETHANE	ug/L	--		--		--		<5		<5		<5		<5	
1,1-DICHLOROETHANE	ug/L	--		--		--		<5		<5		<5		2.4	J|JQ
1,1-DICHLOROETHENE	ug/L	--		--		--		<5		<5		<5		2.3	J|JQ
1,2-DICHLOROETHANE	ug/L	--		--		--		<5		<5		<5		<5	
1,2-DICHLOROPROPANE	ug/L	--		--		--		<5		<5		<5		<5	
2-BUTANONE	ug/L	--		--		--		<10		<10		<10		<10	
2-CHLOROETHYLVINYLETHER	ug/L	--		--		--		<20		<20		<20		<20	
2-HEXANONE	ug/L	--		--		--		<10		<10		<10		<10	
4-METHYL-2-PENTANONE	ug/L	--		--		--		<10		<10		<10		<10	
ACETONE	ug/L	--		--		--		6.1	JB|Uz	<10		<10		<10	
BENZENE	ug/L	3.2	J|JQ	<5		<5		<5		<5		<5		<5	
BROMODICHLOROMETHANE	ug/L	--		--		--		<5		<5		<5		<5	
BROMOFORM	ug/L	--		--		--		<5		<5		<5		<5	
BROMOMETHANE	ug/L	--		--		--		<5		<5		<5		<5	
CARBON DISULFIDE	ug/L	--		--		--		1.5	J|JQ	<5		<5		<5	
CARBON TETRACHLORIDE	ug/L	--		--		--		<5		<5		<5		<5	
CHLOROBENZENE	ug/L	--		--		--		<5		<5		<5		<5	
CHLOROETHANE	ug/L	--		--		--		<5		<5		<5		<5	
CHLOROFORM	ug/L	--		--		--		<5		<5		<5		<5	
CHLOROMETHANE	ug/L	--		--		--		<5		<5		<5		<5	
CIS-1,2-DICHLOROETHENE	ug/L	--		--		--		<5		<5		<5		<5	
CIS-1,3-DICHLOROPROPENE	ug/L	--		--		--		<5		<5		<5		<5	
DIBROMOCHLOROMETHANE	ug/L	--		--		--		<5		<5		<5		<5	
ETHYLBENZENE	ug/L	54		9.5		4.9	J|JQ	9.7		<5		<5		<5	
M,P-XYLENE	ug/L	180		140		3.7	J|JQ	94		<5		<5		<5	
METHYLENE CHLORIDE	ug/L	--		--		--		<5		<5		<5		<5	
O-XYLENE	ug/L	120		19		14		37		<5		<5		<5	
STYRENE	ug/L	--		--		--		<5		<5		<5		<5	
TETRACHLOROETHENE	ug/L	--		--		--		<5		<5		<5		<5	
TOLUENE	ug/L	55		6.2		1.4	J|JQ	12		<5		<5		<5	
TRANS-1,2-DICHLOROETHENE	ug/L	--		--		--		<5		<5		<5		<5	
TRANS-1,3-DICHLOROPROPENE	ug/L	--		--		--		<5		<5		<5		<5	
TRICHLOROETHENE	ug/L	--		--		--		<5		<5		<5		<5	
TRICHLOROFLUOROMETHANE	ug/L	--		--		--		<5		<5		<5		<5	
VINYL ACETATE	ug/L	--		--		--		<10		<10		<10		<10	
VINYL CHLORIDE	ug/L	--		--		--		<5		<5		<5		<5	
1,2-DICHLOROBENZENE	ug/L	--		--		--		<5		<5		<5		<5	
1,3-DICHLOROBENZENE	ug/L	--		--		--		<5		<5		<5		<5	
1,4-DICHLOROBENZENE	ug/L	--		--		--		<5		<5		<5		<5	

ANALYTICAL RESULTS - VOLATILES
DISSOLVED PHASE INVESTIGATION - JUNE 1996
CHEVRON HAWAII REFINERY

ANALYTE	LOCATION / DATE / QA	UNITS	EBS-001 06/24/96 RINSATE BLANK	TBS-001 06/20/96 TRIP BLANK	TBS-002 06/21/96 TRIP BLANK	TBS-003 06/21/96 TRIP BLANK	TBS-004 06/24/96 TRIP BLANK
1,1,1-TRICHLOROETHANE		ug/L	--	<5	<5	<5	<5
1,1,2,2-TETRACHLOROETHANE		ug/L	--	<5	<5	<5	<5
1,1,2-TRICHLOROETHANE		ug/L	--	<5	<5	<5	<5
1,1-DICHLOROETHANE		ug/L	--	<5	<5	<5	<5
1,1-DICHLOROETHENE		ug/L	--	<5	<5	<5	<5
1,2-DICHLOROETHANE		ug/L	--	<5	<5	<5	<5
1,2-DICHLOROPROPANE		ug/L	--	<5	<5	<5	<5
2-BUTANONE		ug/L	--	<10	<10	<10	<10
2-CHLOROETHYLVINYLETHER		ug/L	--	<20	<20	<20	<20
2-HEXANONE		ug/L	--	<10	<10	<10	<10
4-METHYL-2-PENTANONE		ug/L	--	<10	<10	<10	<10
ACETONE		ug/L	--	4.5 JB|Uz	<10	5.3 JB|Uz	6.1 JB|Uz
BENZENE		ug/L	<5	<5	<5	<5	<5
BROMODICHLOROMETHANE		ug/L	--	<5	<5	<5	<5
BROMOFORM		ug/L	--	<5	<5	<5	<5
BROMOMETHANE		ug/L	--	<5	<5	<5	<5
CARBON DISULFIDE		ug/L	--	<5	<5	<5	<5
CARBON TETRACHLORIDE		ug/L	--	<5	<5	<5	<5
CHLOROBENZENE		ug/L	--	<5	<5	<5	<5
CHLOROETHANE		ug/L	--	<5	<5	<5	<5
CHLOROFORM		ug/L	--	<5	<5	<5	<5
CHLOROMETHANE		ug/L	--	<5	<5	<5	<5
CIS-1,2-DICHLOROETHENE		ug/L	--	<5	<5	<5	<5
CIS-1,3-DICHLOROPROPENE		ug/L	--	<5	<5	<5	<5
DIBROMOCHLOROMETHANE		ug/L	--	<5	<5	<5	<5
ETHYLBENZENE		ug/L	<5	<5	<5	<5	<5
M,P-XYLENE		ug/L	<5	<5	<5	<5	<5
METHYLENE CHLORIDE		ug/L	--	<5	<5	<5	<5
O-XYLENE		ug/L	<5	<5	<5	<5	<5
STYRENE		ug/L	--	<5	<5	<5	<5
TETRACHLOROETHENE		ug/L	--	<5	<5	<5	<5
TOLUENE		ug/L	<5	<5	<5	<5	<5
TRANS-1,2-DICHLOROETHENE		ug/L	--	<5	<5	<5	<5
TRANS-1,3-DICHLOROPROPENE		ug/L	--	<5	<5	<5	<5
TRICHLOROETHENE		ug/L	--	<5	<5	<5	<5
TRICHLOROFLUOROMETHANE		ug/L	--	<5	<5	<5	<5
VINYL ACETATE		ug/L	--	<10	<10	<10	<10
VINYL CHLORIDE		ug/L	--	<5	<5	<5	<5
1,2-DICHLOROBENZENE		ug/L	--	<5	<5	<5	<5
1,3-DICHLOROBENZENE		ug/L	--	<5	<5	<5	<5
1,4-DICHLOROBENZENE		ug/L	--	<5	<5	<5	<5

ANALYTICAL RESULTS - SVOCs
DISSOLVED PHASE INVESTIGATION - JUNE 1996
CHEVRON HAWAII REFINERY

		NORTH PROFILE					CENTRAL PROFILE	
LOCATION		C3-65	C4-76	C4-76	B4-61	A3-62	D6-R34	C6-R36
DATE		06/24/96	06/24/96	06/24/96 DUPLICATE	06/21/96	06/20/96	06/21/96	06/21/96
ANALYTE	UNITS							
1,2,4-TRICHLOROBENZENE	ug/L	<10	<10	<10	--	--	<11.	--
1,2-DICHLOROBENZENE	ug/L	<10	<10	<10	--	--	<11.	--
1,3-DICHLOROBENZENE	ug/L	<10	<10	<10	--	--	<11.	--
1,4-DICHLOROBENZENE	ug/L	<10	<10	<10	--	--	<11.	--
2,4,5-TRICHLOROPHENOL	ug/L	<10	<10	<10	--	--	<11.	--
2,4,6-TRICHLOROPHENOL	ug/L	<10	<10	<10	--	--	<11.	--
2,4-DICHLOROPHENOL	ug/L	<10	<10	<10	--	--	<11.	--
2,4-DIMETHYLPHENOL	ug/L	<10	<10	<10	--	--	<11.	--
2,4-DINITROPHENOL	ug/L	<50	<50	<50	--	--	<55.	--
2,4-DINITROTOLUENE	ug/L	<10	<10	<10	--	--	<11.	--
2,6-DINITROTOLUENE	ug/L	<10	<10	<10	--	--	<11.	--
2-CHLORONAPHTHALENE	ug/L	<10	8.1 J|JQ	<10	--	--	<11.	--
2-CHLOROPHENOL	ug/L	<10	<10	<10	--	--	<11.	--
2-METHYLNAPHTHALENE	ug/L	7.8 J|JQ	6.9 J|JQ	<10	--	--	20.	--
2-METHYLPHENOL	ug/L	<10	<10	<10	--	--	<11.	--
2-NITROANILINE	ug/L	<50	<50	<50	--	--	<55.	--
2-NITROPHENOL	ug/L	<10	<10	<10	--	--	<11.	--
3,3'-DICHLOROBENZIDINE	ug/L	<20	<20	<20	--	--	<22.	--
3-NITROANILINE	ug/L	<50	<50	<50	--	--	<55.	--
4,6-DINITRO-2-METHYLPHENOL	ug/L	<50	<50	<50	--	--	<55.	--
4-BROMOPHENYL-PHENYLETHER	ug/L	<10	<10	<10	--	--	<11.	--
4-CHLORO-3-METHYLPHENOL	ug/L	<20	<20	<20	--	--	<22.	--
4-CHLOROANILINE	ug/L	<20	<20	<20	--	--	<22.	--
4-CHLOROPHENYL-PHENYLETHER	ug/L	<10	<10	<10	--	--	<11.	--
4-METHYLPHENOL	ug/L	<10	<10	<10	--	--	<11.	--
4-NITROANILINE	ug/L	<20	<20	<20	--	--	<22.	--
4-NITROPHENOL	ug/L	<50	<50	<50	--	--	<55.	--
ACENAPHTHENE	ug/L	<0.1	12	9.8	<0.1	<0.1	2.9	<0.1
ACENAPHTHYLENE	ug/L	<0.1	1.7	1.6	<0.1	<0.1	0.36	<0.1
ANTHRACENE	ug/L	<0.1	0.58	0.35	<0.1	<0.1	0.22	<0.1
BENZO(A)ANTHRACENE	ug/L	<0.1	<0.1	<0.11	<0.1	<0.1	<0.1	<0.1
BENZO(A)PYRENE	ug/L	<0.1	<0.1	<0.11	<0.1	<0.1	<0.1	<0.1
BENZO(B)FLUORANTHENE	ug/L	<0.1	<0.1	<0.11	<0.1	<0.1	<0.1	<0.1
BENZO(G,H,I)PERYLENE	ug/L	<0.1	<0.1	<0.11	<0.1	<0.1	<0.1	<0.1
BENZO(K)FLUORANTHENE	ug/L	<0.1	<0.1	<0.11	<0.1	<0.1	<0.1	<0.1
BENZOIC ACID	ug/L	<50	<50	<50	--	--	<55.	--
BENZYL ALCOHOL	ug/L	<20	<20	<20	--	--	<22.	--
BIS(2-CHLOROETHOXY)METHANE	ug/L	<10	<10	<10	--	--	<11.	--
BIS(2-CHLOROETHYL)ETHER	ug/L	<10	<10	<10	--	--	<11.	--
BIS(2-CHLOROISOPROPYL)ETHER	ug/L	<10	<10	<10	--	--	<11.	--
BIS(2-ETHYLHEXYL)PHTHALATE	ug/L	3.7 J|JQ	3.8 J|JQ	<10	--	--	340 E|JQ	--
BUTYLBENZYLPHTHALATE	ug/L	<10	<10	<10	--	--	<11.	--
CARBAZOLE	ug/L	<10	<10	<10	--	--	<11.	--

ANALYTICAL RESULTS - SVOCs
DISSOLVED PHASE INVESTIGATION - JUNE 1996
CHEVRON HAWAII REFINERY

		CENTRAL PROFILE			CENTRAL - ADDITIONAL WELLS			
LOCATION		C6-R36	C6-R37	C6-56	C6-R04	B5-R08	C6-58	C7-54
DATE		06/21/96	06/20/96	06/20/96	06/21/96	06/24/96	06/20/96	06/20/96
QA		DUPLICATE						
ANALYTE	UNITS							
1,2,4-TRICHLOROBENZENE	ug/L	--	--	--	<10.	<10	--	<10.
1,2-DICHLOROBENZENE	ug/L	--	--	--	<10.	<10	--	<10.
1,3-DICHLOROBENZENE	ug/L	--	--	--	<10.	<10	--	<10.
1,4-DICHLOROBENZENE	ug/L	--	--	--	<10.	<10	--	<10.
2,4,5-TRICHLOROPHENOL	ug/L	--	--	--	<10.	<10	--	<10.
2,4,6-TRICHLOROPHENOL	ug/L	--	--	--	<10.	<10	--	<10.
2,4-DICHLOROPHENOL	ug/L	--	--	--	<10.	<10	--	<10.
2,4-DIMETHYLPHENOL	ug/L	--	--	--	<10.	<10	--	<10.
2,4-DINITROPHENOL	ug/L	--	--	--	<50.	<50	--	<50.
2,4-DINITROTOLUENE	ug/L	--	--	--	<10.	<10	--	<10.
2,6-DINITROTOLUENE	ug/L	--	--	--	<10.	<10	--	<10.
2-CHLORONAPHTHALENE	ug/L	--	--	--	<10.	<10	--	<10.
2-CHLOROPHENOL	ug/L	--	--	--	<10.	<10	--	<10.
2-METHYLNAPHTHALENE	ug/L	--	--	--	<10.	<10	--	<10.
2-METHYLPHENOL	ug/L	--	--	--	<10.	<10	--	<10.
2-NITROANILINE	ug/L	--	--	--	<50.	<50	--	<50.
2-NITROPHENOL	ug/L	--	--	--	<10.	<10	--	<10.
3,3'-DICHLOROBENZIDINE	ug/L	--	--	--	<20.	<20	--	<20.
3-NITROANILINE	ug/L	--	--	--	<50.	<50	--	<50.
4,6-DINITRO-2-METHYLPHENOL	ug/L	--	--	--	<50.	<50	--	<50.
4-BROMOPHENYL-PHENYLETHER	ug/L	--	--	--	<10.	<10	--	<10.
4-CHLORO-3-METHYLPHENOL	ug/L	--	--	--	<20.	<20	--	<20.
4-CHLOROANILINE	ug/L	--	--	--	<20.	<20	--	<20.
4-CHLOROPHENYL-PHENYLETHER	ug/L	--	--	--	<10.	<10	--	<10.
4-METHYLPHENOL	ug/L	--	--	--	<10.	<10	--	<10.
4-NITROANILINE	ug/L	--	--	--	<20.	<20	--	<20.
4-NITROPHENOL	ug/L	--	--	--	<50.	<50	--	<50.
ACENAPHTHENE	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
ACENAPHTHYLENE	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
ANTHRACENE	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BENZO(A)ANTHRACENE	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BENZO(A)PYRENE	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BENZO(B)FLUORANTHENE	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BENZO(G,H,I)PERYLENE	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BENZO(K)FLUORANTHENE	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BENZOIC ACID	ug/L	--	--	--	<50.	<50	--	<50.
BENZYL ALCOHOL	ug/L	--	--	--	<20.	<20	--	<20.
BIS(2-CHLOROETHOXY)METHANE	ug/L	--	--	--	<10.	<10	--	<10.
BIS(2-CHLOROETHYL)ETHER	ug/L	--	--	--	<10.	<10	--	<10.
BIS(2-CHLOROISOPROPYL)ETHER	ug/L	--	--	--	<10.	<10	--	<10.
BIS(2-ETHYLHEXYL)PHTHALATE	ug/L	--	--	--	<10.	<10	--	<10.
BUTYLBENZYLPHTHALATE	ug/L	--	--	--	<10.	<10	--	<10.
CARBAZOLE	ug/L	--	--	--	<10.	<10	--	<10.

ANALYTICAL RESULTS - SVOCs
DISSOLVED PHASE INVESTIGATION - JUNE 1996
CHEVRON HAWAII REFINERY

		SOUTH PROFILE				SOUTH - ADDITIONAL WELLS			
LOCATION		D7-34	D7-15	D7-33	D7-51	D8-50		D8-48	
DATE		06/21/96	06/21/96	06/20/96	06/20/96	06/20/96		06/20/96	
QA									
ANALYTE	UNITS								
1,2,4-TRICHLOROBENZENE	ug/L	<10.	--	--	--	<10.		<10.	
1,2-DICHLOROBENZENE	ug/L	<10.	--	--	--	<10.		<10.	
1,3-DICHLOROBENZENE	ug/L	<10.	--	--	--	<10.		<10.	
1,4-DICHLOROBENZENE	ug/L	<10.	--	--	--	<10.		<10.	
2,4,5-TRICHLOROPHENOL	ug/L	<10.	--	--	--	<10.		<10.	
2,4,6-TRICHLOROPHENOL	ug/L	<10.	--	--	--	<10.		<10.	
2,4-DICHLOROPHENOL	ug/L	<10.	--	--	--	<10.		<10.	
2,4-DIMETHYLPHENOL	ug/L	<10.	--	--	--	<10.		<10.	
2,4-DINITROPHENOL	ug/L	<51.	--	--	--	<51.		<50.	
2,4-DINITROTOLUENE	ug/L	<10.	--	--	--	<10.		<10.	
2,6-DINITROTOLUENE	ug/L	<10.	--	--	--	<10.		<10.	
2-CHLORONAPHTHALENE	ug/L	<10.	--	--	--	<10.		<10.	
2-CHLOROPHENOL	ug/L	<10.	--	--	--	<10.		<10.	
2-METHYLNAPHTHALENE	ug/L	<10.	--	--	--	15.		<10.	
2-METHYLPHENOL	ug/L	<10.	--	--	--	<10.		<10.	
2-NITROANILINE	ug/L	<51.	--	--	--	<51.		<50.	
2-NITROPHENOL	ug/L	<10.	--	--	--	<10.		<10.	
3,3'-DICHLOROBENZIDINE	ug/L	<20.	--	--	--	<20.		<20.	
3-NITROANILINE	ug/L	<51.	--	--	--	<51.		<50.	
4,6-DINITRO-2-METHYLPHENOL	ug/L	<51.	--	--	--	<51.		<50.	
4-BROMOPHENYL-PHENYLETHER	ug/L	<10.	--	--	--	<10.		<10.	
4-CHLORO-3-METHYLPHENOL	ug/L	<20.	--	--	--	<20.		<20.	
4-CHLOROANILINE	ug/L	<20.	--	--	--	<20.		<20.	
4-CHLOROPHENYL-PHENYLETHER	ug/L	<10.	--	--	--	<10.		<10.	
4-METHYLPHENOL	ug/L	<10.	--	--	--	<10.		<10.	
4-NITROANILINE	ug/L	<20.	--	--	--	<20.		<20.	
4-NITROPHENOL	ug/L	<51.	--	--	--	<51.		<50.	
ACENAPHTHENE	ug/L	<0.1	6.9	5.3	0.83	0.9		<0.1	
ACENAPHTHYLENE	ug/L	<0.1	2.8	1.8	0.15	0.26		<0.1	
ANTHRACENE	ug/L	<0.1	0.91	2.5	0.14	<0.1		<0.1	
BENZO(A)ANTHRACENE	ug/L	<0.1	0.71	3.4	<0.1	<0.1		<0.1	
BENZO(A)PYRENE	ug/L	<0.1	0.59	4.4	<0.1	<0.1		<0.1	
BENZO(B)FLUORANTHENE	ug/L	<0.1	0.33	2.7	<0.1	<0.1		<0.1	
BENZO(G,H,I)PERYLENE	ug/L	<0.1	0.25	3.2	<0.1	<0.1		<0.1	
BENZO(K)FLUORANTHENE	ug/L	<0.1	<0.1	<0.51	<0.1	<0.1		<0.1	
BENZOIC ACID	ug/L	<51.	--	--	--	<51.		<50.	
BENZYL ALCOHOL	ug/L	<20.	--	--	--	<20.		<20.	
BIS(2-CHLOROETHOXY)METHANE	ug/L	<10.	--	--	--	<10.		<10.	
BIS(2-CHLOROETHYL)ETHER	ug/L	<10.	--	--	--	<10.		<10.	
BIS(2-CHLOROISOPROPYL)ETHER	ug/L	<10.	--	--	--	<10.		<10.	
BIS(2-ETHYLHEXYL)PHTHALATE	ug/L	<10.	--	--	--	3.5	J|JQ	<10.	
BUTYLBENZYLPHTHALATE	ug/L	<10.	--	--	--	<10.		<10.	
CARBAZOLE	ug/L	<10.	--	--	--	<10.		<10.	

ANALYTICAL RESULTS - SVOCs
DISSOLVED PHASE INVESTIGATION - JUNE 1996
CHEVRON HAWAII REFINERY

		BACKROUND WELLS		
	LOCATION	I3-67	C2-64	EBS-001
	DATE	06/21/96	06/20/96	06/24/96
	QA			RINSTATE
ANALYTE	UNITS			BLANK
1,2,4-TRICHLOROBENZENE	ug/L	<10.	<10.	--
1,2-DICHLOROBENZENE	ug/L	<10.	<10.	--
1,3-DICHLOROBENZENE	ug/L	<10.	<10.	--
1,4-DICHLOROBENZENE	ug/L	<10.	<10.	--
2,4,5-TRICHLOROPHENOL	ug/L	<10.	<10.	--
2,4,6-TRICHLOROPHENOL	ug/L	<10.	<10.	--
2,4-DICHLOROPHENOL	ug/L	<10.	<10.	--
2,4-DIMETHYLPHENOL	ug/L	<10.	<10.	--
2,4-DINITROPHENOL	ug/L	<50.	<50.	--
2,4-DINITROTOLUENE	ug/L	<10.	<10.	--
2,6-DINITROTOLUENE	ug/L	<10.	<10.	--
2-CHLORONAPHTHALENE	ug/L	<10.	<10.	--
2-CHLOROPHENOL	ug/L	<10.	<10.	--
2-METHYLNAPHTHALENE	ug/L	<10.	<10.	--
2-METHYLPHENOL	ug/L	<10.	<10.	--
2-NITROANILINE	ug/L	<50.	<50.	--
2-NITROPHENOL	ug/L	<10.	<10.	--
3,3'-DICHLOROBENZIDINE	ug/L	<20.	<20.	--
3-NITROANILINE	ug/L	<50.	<50.	--
4,6-DINITRO-2-METHYLPHENOL	ug/L	<50.	<50.	--
4-BROMOPHENYL-PHENYLETHER	ug/L	<10.	<10.	--
4-CHLORO-3-METHYLPHENOL	ug/L	<20.	<20.	--
4-CHLOROANILINE	ug/L	<20.	<20.	--
4-CHLOROPHENYL-PHENYLETHER	ug/L	<10.	<10.	--
4-METHYLPHENOL	ug/L	<10.	<10.	--
4-NITROANILINE	ug/L	<20.	<20.	--
4-NITROPHENOL	ug/L	<50.	<50.	--
ACENAPHTHENE	ug/L	<0.1	<0.1	<0.11
ACENAPHTHYLENE	ug/L	<0.1	<0.1	<0.11
ANTHRACENE	ug/L	<0.1	<0.1	<0.11
BENZO(A)ANTHRACENE	ug/L	<0.1	<0.1	<0.11
BENZO(A)PYRENE	ug/L	<0.1	<0.1	<0.11
BENZO(B)FLUORANTHENE	ug/L	<0.1	<0.1	<0.11
BENZO(G,H,I)PERYLENE	ug/L	<0.1	<0.1	<0.11
BENZO(K)FLUORANTHENE	ug/L	<0.1	<0.1	<0.11
BENZOIC ACID	ug/L	<50.	<50.	--
BENZYL ALCOHOL	ug/L	<20.	<20.	--
BIS(2-CHLOROETHOXY)METHANE	ug/L	<10.	<10.	--
BIS(2-CHLOROETHYL)ETHER	ug/L	<10.	<10.	--
BIS(2-CHLOROISOPROPYL)ETHER	ug/L	<10.	<10.	--
BIS(2-ETHYLHEXYL)PHTHALATE	ug/L	4.7 JJQ	<10.	--
BUTYLBENZYLPHTHALATE	ug/L	<10.	<10.	--
CARBAZOLE	ug/L	<10.	<10.	--

ANALYTICAL RESULTS - SVOCs
DISSOLVED PHASE INVESTIGATION - JUNE 1996
CHEVRON HAWAII REFINERY
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		NORTH PROFILE					CENTRAL PROFILE	
	LOCATION	C3-65	C4-76	C4-76	B4-61	A3-62	D6-R34	C6-R36
	DATE	06/24/96	06/24/96	06/24/96	06/21/96	06/20/96	06/21/96	06/21/96
	QA			DUPLICATE				
ANALYTE	UNITS							
CHRYSENE	ug/L	<0.1	<0.1	<0.11	<0.1	<0.1	0.26	<0.1
DI-N-BUTYLPHTHALATE	ug/L	<10	<10	<10	--	--	<11.	--
DI-N-OCTYLPHTHALATE	ug/L	<10	<10	<10	--	--	<11.	--
DIBENZ(A,H)ANTHRACENE	ug/L	<0.1	<0.1	<0.11	<0.1	<0.1	<0.1	<0.1
DIBENZOFURAN	ug/L	<10	<10	<10	--	--	<11.	--
DIETHYLPHTHALATE	ug/L	<10	<10	<10	--	--	<11.	--
DIMETHYLPHTHALATE	ug/L	<10	<10	<10	--	--	<11.	--
FLUORANTHENE	ug/L	<0.1	<0.1	<0.11	<0.1	<0.1	<0.1	<0.1
FLUORENE	ug/L	<0.1	1.3	1.2	<0.1	<0.1	1.2	<0.1
HEXACHLOROBENZENE	ug/L	<10	<10	<10	--	--	<11.	--
HEXACHLOROBUTADIENE	ug/L	<10	<10	<10	--	--	<11.	--
HEXACHLOROCYCLOPENTADIENE	ug/L	<10	<10	<10	--	--	<11.	--
HEXACHLOROETHANE	ug/L	<10	<10	<10	--	--	<11.	--
INDENO(1,2,3-CD)PYRENE	ug/L	<0.1	<0.1	<0.11	<0.1	<0.1	<0.1	<0.1
ISOPHORONE	ug/L	<10	<10	<10	--	--	<11.	--
N-NITROSO-DI-N-PROPYLAMINE	ug/L	<10	<10	<10	--	--	<11.	--
N-NITROSODIPHENYLAMINE (1)	ug/L	<10	<10	<10	--	--	<11.	--
NAPHTHALENE	ug/L	<0.4	5	4.4	<0.4 |UJ|	<0.4 |UJ|	10 |J|i	<0.4 |UJ|
NITROBENZENE	ug/L	<10	<10	<10	--	--	<11.	--
PENTACHLOROPHENOL	ug/L	<50	<50	<50	--	--	<55.	--
PHENANTHRENE	ug/L	<0.1	0.27	0.23	<0.1	<0.1	0.32	<0.1
PHENOL	ug/L	<10	<10	<10	--	--	<11.	--
PYRENE	ug/L	<0.1	0.17	0.16	<0.1	<0.1	0.66	0.13

ANALYTICAL RESULTS - SVOCs
DISSOLVED PHASE INVESTIGATION - JUNE 1996
CHEVRON HAWAII REFINERY

		CENTRAL PROFILE			CENTRAL - ADDITIONAL WELLS			
LOCATION		C6-R36	C6-R37	C6-56	C6-R04	B5-R08	C6-58	C7-54
DATE		06/21/96	06/20/96	06/20/96	06/21/96	06/24/96	06/20/96	06/20/96
QA		DUPLICATE						
ANALYTE	UNITS							
CHRYSENE	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
DI-N-BUTYLPHTHALATE	ug/L	--	--	--	<10.	<10	--	<10.
DI-N-OCTYLPHTHALATE	ug/L	--	--	--	<10.	<10	--	<10.
DIBENZ(A,H)ANTHRACENE	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
DIBENZOFURAN	ug/L	--	--	--	<10.	<10	--	<10.
DIETHYLPHTHALATE	ug/L	--	--	--	<10.	<10	--	<10.
DIMETHYLPHTHALATE	ug/L	--	--	--	<10.	<10	--	<10.
FLUORANTHENE	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
FLUORENE	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HEXACHLOROBENZENE	ug/L	--	--	--	<10.	<10	--	<10.
HEXACHLOROBUTADIENE	ug/L	--	--	--	<10.	<10	--	<10.
HEXACHLOROCYCLOPENTADIENE	ug/L	--	--	--	<10.	<10	--	<10.
HEXACHLOROETHANE	ug/L	--	--	--	<10.	<10	--	<10.
INDENO(1,2,3-CD)PYRENE	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
ISOPHORONE	ug/L	--	--	--	<10.	<10	--	<10.
N-NITROSO-DI-N-PROPYLAMINE	ug/L	--	--	--	<10.	<10	--	<10.
N-NITROSODIPHENYLAMINE (1)	ug/L	--	--	--	<10.	<10	--	<10.
NAPHTHALENE	ug/L	<0.4 |UJ|	<0.4 |UJ|	<0.4 |UJ|	<0.4 |UJ|	<0.4	<0.4 |UJ|	<0.4 |UJ|
NITROBENZENE	ug/L	--	--	--	<10.	<10	--	<10.
PENTACHLOROPHENOL	ug/L	--	--	--	<50.	<50	--	<50.
PHENANTHRENE	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
PHENOL	ug/L	--	--	--	<10.	<10	--	<10.
PYRENE	ug/L	0.11	0.12	<0.1	<0.1	0.17	0.17	<0.1

ANALYTICAL RESULTS - SVOCs
DISSOLVED PHASE INVESTIGATION - JUNE 1996
CHEVRON HAWAII REFINERY
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		SOUTH PROFILE				SOUTH - ADDITIONAL WELLS	
	LOCATION	D7-34	D7-15	D7-33	D7-51	D8-50	D8-48
	DATE	06/21/96	06/21/96	06/20/96	06/20/96	06/20/96	06/20/96
	QA						
ANALYTE	UNITS						
CHRYSENE	ug/L	<0.1	1.6	9	<0.1	<0.1	<0.1
DI-N-BUTYLPHTHALATE	ug/L	<10.	--	--	--	<10.	<10.
DI-N-OCTYLPHTHALATE	ug/L	<10.	--	--	--	<10.	<10.
DIBENZ(A,H)ANTHRACENE	ug/L	<0.1	<0.1	0.96	<0.1	<0.1	<0.1
DIBENZOFURAN	ug/L	<10.	--	--	--	<10.	<10.
DIETHYLPHTHALATE	ug/L	<10.	--	--	--	<10.	<10.
DIMETHYLPHTHALATE	ug/L	<10.	--	--	--	<10.	<10.
FLUORANTHENE	ug/L	<0.1	0.2	1.3	<0.1	<0.1	<0.1
FLUORENE	ug/L	<0.1	8	5.3	0.8	1.1	<0.1
HEXACHLOROBENZENE	ug/L	<10.	--	--	--	<10.	<10.
HEXACHLOROBUTADIENE	ug/L	<10.	--	--	--	<10.	<10.
HEXACHLOROCYCLOPENTADIENE	ug/L	<10.	--	--	--	<10.	<10.
HEXACHLOROETHANE	ug/L	<10.	--	--	--	<10.	<10.
INDENO(1,2,3-CD)PYRENE	ug/L	<0.1	<0.1	0.84	<0.1	<0.1	<0.1
ISOPHORONE	ug/L	<10.	--	--	--	<10.	<10.
N-NITROSO-DI-N-PROPYLAMINE	ug/L	<10.	--	--	--	<10.	<10.
N-NITROSODIPHENYLAMINE (1)	ug/L	<10.	--	--	--	<10.	<10.
NAPHTHALENE	ug/L	<0.4 |J1	460 |J1	3.5 |J1	<0.4 |UJ1	1.5 |J1	<0.4 |UJ1
NITROBENZENE	ug/L	<10.	--	--	--	<10.	<10.
PENTACHLOROPHENOL	ug/L	<51.	--	--	--	<51.	<50.
PHENANTHRENE	ug/L	<0.1	15	4.1	0.21	0.38	<0.1
PHENOL	ug/L	<10.	--	--	--	<10.	<10.
PYRENE	ug/L	<0.1	1.9	9	0.11	<0.1	<0.1

ANALYTICAL RESULTS - SVOCs
DISSOLVED PHASE INVESTIGATION - JUNE 1996
CHEVRON HAWAII REFINERY
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		BACKROUND WELLS				
	LOCATION	I3-67		C2-64		EBS-001
	DATE	06/21/96		06/20/96		06/24/96
	QA					RINSTATE
ANALYTE	UNITS					BLANK
CHRYSENE	ug/L	<0.1		<0.1		<0.11
DI-N-BUTYLPHTHALATE	ug/L	<10.		<10.		--
DI-N-OCTYLPHTHALATE	ug/L	<10.		<10.		--
DIBENZ(A,H)ANTHRACENE	ug/L	<0.1		<0.1		<0.11
DIBENZOFURAN	ug/L	<10.		<10.		--
DIETHYLPHTHALATE	ug/L	<10.		<10.		--
DIMETHYLPHTHALATE	ug/L	<10.		<10.		--
FLUORANTHENE	ug/L	<0.1		<0.1		<0.11
FLUORENE	ug/L	<0.1		<0.1		<0.11
HEXACHLOROBENZENE	ug/L	<10.		<10.		--
HEXACHLOROBUTADIENE	ug/L	<10.		<10.		--
HEXACHLOROCYCLOPENTADIENE	ug/L	<10.		<10.		--
HEXACHLOROETHANE	ug/L	<10.		<10.		--
INDENO(1,2,3-CD)PYRENE	ug/L	<0.1		<0.1		<0.11
ISOPHORONE	ug/L	<10.		<10.		--
N-NITROSO-DI-N-PROPYLAMINE	ug/L	<10.		<10.		--
N-NITROSODIPHENYLAMINE (1)	ug/L	<10.		<10.		--
NAPHTHALENE	ug/L	<0.4	UJ	<0.4	UJ	<0.42
NITROBENZENE	ug/L	<10.		<10.		--
PENTACHLOROPHENOL	ug/L	<50.		<50.		--
PHENANTHRENE	ug/L	<0.1		<0.1		<0.11
PHENOL	ug/L	<10.		<10.		--
PYRENE	ug/L	<0.1		<0.1		<0.11

ANALYTICAL RESULTS - METALS
DISSOLVED PHASE INVESTIGATION - JUNE 1996
CHEVRON HAWAII REFINERY

		NORTH PROFILE				CENTRAL PROFILE		
LOCATION		C3-65	C4-76	B4-61	A3-62	D6-R34	C6-R36	C6-R36
DATE		06/24/96	06/24/96	06/21/96	06/20/96	06/21/96	06/21/96	06/21/96
QA			DUPLICATE					DUPLICATE
ANALYTE	UNITS							
ARSENIC, TOTAL	mg/L	0.0043 BJm	<0.0020 UJm	0.032	<0.0030	<0.0030	0.0059 BJQ	0.0050 BJQ
CADMIUM, TOTAL	mg/L	<0.0030	<0.0030	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
CHROMIUM, TOTAL	mg/L	<0.0060	<0.0060	0.033	0.012	<0.0060	<0.0060	<0.0060
LEAD, TOTAL	mg/L	<0.0020	<0.0020	<0.010	<0.010	<0.010	<0.010	<0.010
MERCURY, TOTAL	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
NICKEL, TOTAL	mg/L	<0.012	<0.012	0.014 BJQ	<0.013	<0.013	0.022 BJQ	0.016 BJQ
VANADIUM, TOTAL	mg/L	<0.0060	<0.0060	0.012 BJQ	<0.0070	<0.0070	<0.0070	<0.0070

ANALYTICAL RESULTS - METALS
DISSOLVED PHASE INVESTIGATION - JUNE 1996
CHEVRON HAWAII REFINERY

		CENTRAL PROFILE		CENTRAL - ADDITIONAL WELLS				SOUTH
	LOCATION	C6-R37	C6-56	C6-R04	B5-R08	C6-58	C7-54	D7-34
	DATE	06/20/96	06/20/96	06/21/96	06/24/96	06/20/96	06/20/96	06/21/96
	QA							
ANALYTE	UNITS							
ARSENIC, TOTAL	mg/L	<0.0030	<0.0030	<0.0030	<0.0020 UJm	<0.0030	<0.0030	0.16
CADMIUM, TOTAL	mg/L	<0.0050	<0.0050	<0.0050	<0.0030	<0.0050	<0.0050	<0.0050
CHROMIUM, TOTAL	mg/L	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.33
LEAD, TOTAL	mg/L	<0.010	<0.010	<0.010	<0.0020	<0.010	<0.010	0.32
MERCURY, TOTAL	mg/L	<0.00020	<0.00020	<0.00020	0.00033	<0.00020	<0.00020	0.0026
NICKEL, TOTAL	mg/L	<0.013	<0.013	<0.013	<0.012	<0.013	<0.013	0.24
VANADIUM, TOTAL	mg/L	<0.0070	<0.0070	<0.0070	<0.0060	<0.0070	<0.0070	0.24

ANALYTICAL RESULTS - METALS
DISSOLVED PHASE INVESTIGATION - JUNE 1996
CHEVRON HAWAII REFINERY

		SOUTH PROFILE			SOUTH - ADDITIONAL WELLS		BACKGROUND WELLS	
	LOCATION	D7-15	D7-33	D7-51	D8-50	D8-48	I3-67	C2-64
	DATE	06/21/96	06/20/96	06/20/96	06/20/96	06/20/96	06/21/96	06/20/96
	QA							
ANALYTE	UNITS							
ARSENIC, TOTAL	mg/L	<0.0030	<0.0030	<0.0030	0.0047 BJQ	0.0071 BSJQ	<0.0030	0.0059 BJQ
CADMIUM, TOTAL	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
CHROMIUM, TOTAL	mg/L	<0.0060	0.039	<0.0060	<0.0060	<0.0060	<0.0060	0.028
LEAD, TOTAL	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
MERCURY, TOTAL	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
NICKEL, TOTAL	mg/L	<0.013	<0.013	<0.013	<0.013	<0.013	0.039 BJQ	0.013 BJQ
VANADIUM, TOTAL	mg/L	<0.0070	<0.0070	<0.0070	0.012 BJQ	<0.0070	0.0075 BJQ	0.011 BJQ

BACKYARDS AREA DISSOLVED PHASE INVESTIGATION
CHEVRON HAWAII REFINERY
KAPOLEI, OAHU, HAWAII

LABORATORY VALIDATION QUALIFIERS DEFINITIONS
Assigned by Analytical Laboratory
(appears in Tables to left of vertical bar)

E	Concentration exceeds linear calibration range. Carried over in the validation process as a "J" qualifier.
U	Not detected at or above the associated reporting limit.
J	Estimated concentration above laboratory method detection limit (MDL) but below laboratory quantitation limit. Carried over in the validation process as a "J" qualifier.
B	Analyte was present in an associated blank.
D	Result from diluted sample.

DATA VALIDATION QUALIFIER DEFINITIONS
Assigned by Dames & Moore's Data Review Team
(appears in Tables to right of vertical bar)

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	Carry over from laboratory "E" or "J" qualifier, or the analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample reporting limit. However, the reported reporting limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

APPENDIX B

APPENDIX B
DATA VALIDATION REPORTS

LEVEL III Data Validation Report

PROJECT: Chevron Hawaii (Dissolved Phase Investigation)

LABORATORY: Lockheed Analytical Services

LAB NUMBER: L7305

SAMPLES: C2-64, C7-54, D8-50, D8-48,TBS-001, C6-R04, D6-R34, TBS-002, D7-34, I3-67, and TBS-003

MATRIX: Water

Analysis	Volatile Organic Compounds 8260	
Holding Time	✓	
Surrogate Recovery	✓	
MS/MSD	✓	
LCS (Blank Spike)	✓	
Method Blanks	Note 1	
Duplicates	✓	
Trip/Field/Equipment Blanks	Note 2	
Detection Limits	Note 3	
Chromatography	NA	

Notes:

1. A result of 4.1 ug/L was reported for Acetone in the method blank performed on June 29, 1996. The concentrations associated with positive detects were flagged "U," anomalous, in all samples.

2. Positive results were observed for Acetone for trip blanks **TBS-001** and **TBS-003**. It should noted, however, the method blank associated with these samples displayed Acetone contamination. Therefore, the positive results observed for the trip blanks are likely due to laboratory contamination, and are qualified as anomalous "U".

3. All results which are quantitated at or below the associated practical quantitation limits should be considered estimated and have been qualified "J".

Summary:

As qualified, these data are usable for their intended purpose. All reported results less than 41 ug/L for Acetone in samples associated with the method blank performed on June 29, 1996 should be considered laboratory contamination and are qualified "U". In addition, low level results at or below the practical quantitation limits should be considered estimated and are qualified "J". No results were rejected.

LEVEL III Data Validation Report

PROJECT: Chevron Hawaii (Dissolved Phase Investigation)

LABORATORY: Lockheed Analytical Services

LAB NUMBER: L7305

SAMPLES: C6-56, C6-58, A3-62, C6-R37, D7-51, D7-33, C6-R36, B8-D1, B4-61, and D7-15

MATRIX: Water

Analysis	Halogenated Volatiles (BTEX) 8260	
Holding Time	✓	
Surrogate Recovery	✓	
MS/MSD	✓	
LCS (Blank Spike)	✓	
Method Blanks	✓	
Duplicates	NA	
Trip/Field/Equipment Blanks	✓	
Detection Limits	Note 1	
Chromatography	NA	

Notes: 1. All results which are quantitated at or below the associated practical quantitation limits should be considered estimated and have been qualified "J".

Summary:

These data are usable for their intended purpose. No results were qualified or rejected.

LEVEL III Data Validation Report

PROJECT: Chevron Hawaii (Dissolved Phase Investigation)

LABORATORY: Lockheed Analytical Services

LAB NUMBER: L7305

SAMPLES: C2-64, C7-54, D8-50, D8-48, reanalysis of D8-48, C6-R04, D6-R34, D7-34, reanalysis of D7-34, I3-67, and the reanalysis of I3-67

MATRIX: Water

Analysis	Semivolatile Organics 8270	
Holding Time	✓	
Surrogate Recovery	Note 1	
MS/MSD	Note 2	
LCS (Blank Spike)	✓	
Method Blanks	✓	
Duplicates	✓	
Trip/Field/Equipment Blanks	NA	
Detection Limits	Note 3	

Notes:

1. Low recoveries were reported for 2-Fluorophenol in samples **D8-48**, **I3-67**, **Method Blank** (7/2/96), and **Method Blank** (7/3/96). Since only a single surrogate is outside the criteria in the acid fraction, no qualification of data is warranted. In addition, low recoveries were reported for 2-Fluorophenol and Terphenyl-d14 in samples **D7-34** and **I3-64**. Since only a single surrogate is outside the criteria in each of the acid and base-neutral fractions, no qualification of the data is warranted.

2. A Matrix Spike/Matrix Spike Duplicate (MS/MSD) was performed on sample **C6-R04** for this analysis. High relative percent differences (RPDs) were reported for 1,4-Dichlorobenzene, N-Nitroso-di-n-propylamine, and 1,2,4-Trichlorobenzene in the MS/MSD results. Since all Laboratory Control Sample (LCS) results and other laboratory QC data met criteria, no qualifications are warranted.

3. All results which are quantitated at or below the associated practical quantitation limits should be considered estimated and have been qualified "J". In addition, results which exceeded the calibration range of the analysis should be considered estimated and have been qualified "J".

Summary:

As qualified, these data are usable for their intended purpose. No results were rejected.

LEVEL III Data Validation Report

PROJECT: Chevron Hawaii (Dissolved Phase Investigation)

LABORATORY: Lockheed Analytical Services

LAB NUMBER: L7305

SAMPLES: C6-56, C6-58, A3-62, C6-R37, C2-64, C7-54, D8-50, D8-48, D7-51, D7-33, C6-R04, C6-R36, D6-R34, B8-D1, B4-61, D7-34, D7-15, and I3-67

MATRIX: Water

Analysis	PAHs - SIM 8270	
Holding Time	✓	
Surrogate Recovery	Note 1	
MS/MSD	Note 2	
LCS (Blank Spike)	Note 3	
Method Blanks	✓	
Duplicates	NA	
Trip/Field/Equipment Blanks	NA	
Detection Limits	Note 4	
Internal Standards	Note 5	

Notes:

1. High surrogate recoveries were reported for Nitrobenzene in samples **D7-33**, the re-analysis of **D7-33**, **D6-R34**, the dilution of **D6-R34**, **D7-15**, the and the re-analysis of sample **D7-15**. High surrogate recoveries were reported for 2-Fluorobiphenyl for the method blanks performed on July 2 and July 3, 1996. It should be noted, these surrogates are not indicative of the performance of PAH compounds, therefore, no data qualification was warranted.

2. A Matrix Spike/Matrix Spike Duplicate (MS/MSD) was performed on sample **C6-R04** for this analysis. Low recoveries were reported for Benzo (b) fluoranthene, Benzo (k) fluoranthene, Benzo (a) pyrene, Indeno (1,2,3-cd) pyrene, Dibenzo (a,h) anthracene, and Benzo (g,h,i) perylene in both the MS and MSD. A low recovery was reported for Naphthalene in the MSD as well. These low recoveries were confirmed in a MS/MSD re-analysis. In addition, a low recovery was observed for Naphthalene in the LCS analysis, see Note 3.

3. A low recovery was reported for Naphthalene in the Laboratory Control Sample (LCS) analysis. As mentioned in Note 2, a low recovery was observed for Naphthalene in the MSD and the re-analysis of the MS/MSD. These low recoveries indicate a low bias for Naphthalene results due to the laboratory analysis and are not indicative of matrix interferences. Positive results for Naphthalene should be considered estimated and have been qualified "J". In addition, non detect results for Naphthalene should be considered biased and have been qualified "UJ".

4. Positive results for Naphthalene and Phenanthrene were reported above the linear calibration range in sample **D7-15.** In order to quantitate these high concentrations a dilution (100x) was performed on sample **D7-15**. Consequently, the detection limits were raised for the diluted sample. The results in the undiluted sample **D7-15** should be considered estimated and have been qualified "J". Data from subsequent dilution analyses are considered valid for these locations. In addition, results which exceeded the calibration range of the analysis should be considered estimated and have been qualified "J".

5. The internal standard area for Naphthalene-d8 was reported below 50% of the associated 12 hour standard for samples **D7-33** and **D6-R34**. Since the quantitation of positive results for Naphthalene utilizes this internal standard, these low recoveries would lower the response obtained. Therefore, any positive results obtained for these samples should be considered biased low. This bias was noted in the LCS and all data for Naphthalene were qualified accordingly (See Note 3).

Summary:

As qualified, these data are usable for their intended purpose. None of the data were rejected.

LEVEL III Data Validation Report

PROJECT: Chevron Hawaii (Dissolved Phase Investigation)

LABORATORY: Lockheed Analytical Services

LAB NUMBER: L7305

SAMPLES: C6-56, C6-58, A3-62, C6-R37, C2-64, C7-54, D8-50, D8-48, D7-51, D7-33, C6-R04, C6-R36, D6-R34, B8-D1, B4-61, D7-34, D7-15, and I3-67

MATRIX: Water

Analysis	Metals[a] 6010	Arsenic 7060	Lead 7421	Mercury 7470
Holding Time	✓	✓	✓	✓
Surrogate Recovery	NA	NA	NA	NA
MS/MSD	Note 1	✓	✓	✓
LCS (Blank Spike)	✓	✓	✓	✓
Method Blanks	✓	✓	✓	✓
Duplicates	NA	NA	NA	NA
Trip/Field/Equipment Blanks	NA	NA	NA	NA
Detection Limits	Note 3	Note 3	Note 2	✓
Internal Standards	NA	NA	NA	NA

[a] - Arsenic, cadmium, lead, mercury, nickel and vanadium

Notes:

1. The spiking level of the Matrix Spike (MS) performed on sample **B4-61** for Chloride was not sufficient to properly evaluate matrix affects due to elevated analyte concentration in the sample.

2. A dilution (5x) was performed on all the samples associated with the Arsenic analysis. Consequently, the detection limits were raised for the diluted samples.

3. All results which are quantitated at or below the associated practical quantitation limits should be considered estimated and have been qualified "J".

Summary:

As qualified, these data are usable for their intended purpose. None of the data were rejected.

LEVEL III Data Validation Report

PROJECT: Chevron Hawaii (Dissolved Phase Investigation)

LABORATORY: Lockheed Analytical Services

LAB NUMBER: L7305

SAMPLES: C6-56, C6-58, A3-62, C6-R37, C2-64, C7-54, D8-50, D8-48, D7-51, D7-33, C6-R04, C6-R36, D6-R34, B8-D1, B4-61, D7-34, D7-15, and I3-67

MATRIX: Water

Analysis	TDS 160.1	Chloride 325.2	Alkalinity 310.1	Nitrate 325.0	Sulfate 375.4
Holding Time	✓	✓	✓	✓	✓
Surrogate Recovery	NA	NA	NA	NA	NA
MS/MSD	✓	Note 2	✓	✓	✓
LCS (Blank Spike)	✓	✓	✓	✓	✓
Method Blanks	✓	✓	✓	✓	Note 3
Duplicates	NA	NA	NA	NA	NA
Trip/Field/Equipment Blanks	NA	NA	NA	NA	NA
Detection Limits	✓	Note 1	✓	Note 4	Note 1
Internal Standards	NA	NA	NA	NA	NA

Note:

1. The reporting limits reported for Chloride and Sulfate are raised due to elevated levels of analytes in the samples. All samples in this data package were diluted (100x) for Chloride. In the Sulfate analysis, sample **I3-67** was diluted 5x, samples **B4-61**, **C6-R04**, **C6-R36**, and **B8-D1** were diluted 10x, samples **C6-58**, **A3-62**, and **C6-R37** were diluted 20x, samples **C6-56**, **C2-64**, **C7-54**, **D8-50**, **D7-51**, and **D7-33** were diluted 50x, and samples **D8-48**, **D7-34**, and **D7-15** were diluted 100x. All dilutions were performed appropriately.

2. The concentration of Chloride in sample C6-R04 was greater than four times the spiked amount, therefore, no evaluation of the Matrix Spike/Matrix Spike Duplicate (MS/MSD) percent recovery is possible.

3. A continuing calibration blank (CCB) contained Sulfate contamination at a concentration of 1.16 ug/L. However, all reported results were greater than five times the concentration reported in the CCB, therefore, no qualification of the data is warranted.

4. All results which are quantitated at or below the associated practical quantitation limits should be considered estimated and have been qualified "J".

Summary:

As qualified, these data are usable for their intended purpose. None of the data were rejected.

Memo

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Action	Info	File
Ed Tschupp	Mary Esper (Dames & Moore) Dirk Koeppenkastrop (ELP)	16000-543-037

From Dan Hakim

Date November 12, 1996

Subject Validity of Ferrous Iron Results

The original results for ferrous iron were qualified based on holding time exceedances. A holding time of 24 hours was used. Results generated within two days of the holding time expiration (within three days of sampling) were qualified as either estimated concentrations or, the case of non-detects, estimated detection limits (flagged "J" or "UJ"). Results produced after three days from sampling were rejected (flagged "R").

This data review was based on the HACH 8146 Method which is an ion-specific colormetric determination of the ferrous ion concentration. This analysis needs to be performed as quickly as possible after sampling due to the possible oxidation of ferrous ions to ferric ions between sampling and analysis.

The HATCH method was implemented by Environmental Laboratory of the Pacific (ELP) on August 6, 1996. The samples in question were analyzed before that date using EPA Method 6010 (ICP).

In order to determine the concentration of ferrous ions, the samples were field filtered. When the pH is between 4 and 9, ferric iron is precipitated as insoluble ferric hydroxide and is filtered out. The filtrate contains only ferrous which then may oxidize to ferric. Since ICP does not distinguish between ionic species the total iron in the filtrate determined by the ICP analysis represents the ferrous iron at the time of field filtering. The ordinary ICP holding time, therefore, applies. The samples need to be filtered in the field immediately.

Consequently, these results are usable without qualifications and no data were rejected.

LEVEL III Data Validation Report

PROJECT: Chevron Hawaii (Dissolved Phase Investigation)

LABORATORY: Environmental Laboratory of the Pacific

LAB NUMBERS: 9606153, 9606154, 9606164, 9606165, 9606171, 9606172

SAMPLES: C7-54, D7-51, D8-50, D8-48, C6-56, C6-58, A3-62, D7-15, C3-65, C4-76, B8-D2, B5-R08, D6-R34, B4-61, C2-64, C6-R37, C6-R36, C6-R05, B8-D1, D7-33, D7-34 and I3-67

MATRIX: Water

Analysis	Ferrous Iron 6010	
Holding Time	Note 1	
MS/MSD	Note 2	
LCS (Blank Spike)	✓	
Method Blanks	Note 3	
Field Duplicates	N/A	
Trip/Field/Equipment Blanks	N/A	
Detection Limits	✓	

Notes:

See memorandum of revision 0 I 1+ 11/11/96

1. Due to the unstable nature of ferrous iron, it is recommended that sample analysis occur immediately upon sample collection. Samples C3-65, C4-76, B8-D2, B5-R08, D6-R34, B4-61, C2-64, C6-R37, C6-R36, B8-D1, D7-34 were analyzed after 24 hours from sample collection which suggests a loss of analyte or oxidation may have occurred. Associated sample data is considered estimated and represents an indeterminate state of dissolved iron concentrations. Samples D7-15, C6-R04, D7-33, I3-67, analyzed 2 - 5 days after sample collection, are rejected due to serious deficiencies in the ability to analyze the samples and meet quality control criteria.

2. MS/MSD recoveries associated with sample batches 9606171, 9606172, 9606164 and 9606165 exceeded acceptance criteria suggesting a high bias in all associated positive results. Samples utilized for MS/MSD analyses were not identified by the laboratory. No further data qualification was warranted since all data were qualified as estimated due to holding time violations.

3. Method blank data were not reported by the laboratory for evaluation. Method blank results are used to evaluate possible contamination or failures in the analytical process.

LEVEL III Data Validation Report
(continued)

PROJECT: Chevron Hawaii (Dissolved Phase Investigation)

LABORATORY: Environmental Laboratory of the Pacific

LAB NUMBERS: 9606153, 9606154, 9606164, 9606165, 9606171, 9606172

SAMPLES: C7-54, D7-51, D8-50, D8-48, C6-56, C6-58, A3-62, D7-15, C3-65, C4-76, B8-D2, B5-R08, D6-R34, B4-61, C2-64, C6-R37, C6-R36, C6-R05, B8-D1, D7-33, D7-34 and I3-67

MATRIX: Water

Summary:
As indicated above, careful consideration should be given to the ~~usability of those~~ data qualified as estimated. Results of samples ~~analyzed~~ after 24 hours from sample collection and field filtering represents ~~an indeterminate~~ state of dissolved iron due to the unstable nature of ~~ferrous iron.~~ Data qualified as rejected should not be used for project decisions.

See memorandum of revision

LEVEL III Data Validation Report

PROJECT: Chevron Hawaii (Dissolved Phase Investigation)

LABORATORY: Environmental Laboratory of the Pacific

SUMMARY OF QUALIFIED DATA

Sample	Lab Report #	Analyte	Result	Qualifier	Reason
D7-15	9606171	Ferrous Iron	<0.1 mg/L	~~R~~	~~Missed Holding Time >2days~~
C3-65	9606171	Ferrous Iron	<0.1 mg/L	~~UJ~~	~~Missed Holding Time <2days~~
C4-76	9606171	Ferrous Iron	<0.1 mg/L	~~UJ~~	~~Missed Holding Time <2days~~
B8-D2	9606171	Ferrous Iron	<0.1 mg/L	~~UJ~~	~~Missed Holding Time <2days~~
B5-R08	9606171	Ferrous Iron	0.2 mg/L	~~J~~	~~Missed Holding Time <2days~~
D6-R34	9606172	Ferrous Iron	0.8 mg/L	~~J~~	~~Missed Holding Time >2days~~
B4-61	9606172	Ferrous Iron	0.6 mg/L	~~J~~	~~Missed Holding Time >2days~~
C2-64	9606164	Ferrous Iron	0.5 mg/L	~~J~~	~~Missed Holding Time >2days~~
C6-R37	9606164	Ferrous Iron	0.7 mg/L	~~J~~	~~Missed Holding Time >2days~~
C6-R36	9606164	Ferrous Iron	1.4 mg/L	~~J~~	~~Missed Holding Time >2days~~
C6-R04	9606164	Ferrous Iron	<0.1mg/L	~~R~~	~~Missed Holding Time >2days~~
B8-D1	9606164	Ferrous Iron	1.3 mg/L	~~J~~	~~Missed Holding Time >2days~~
D7-33	9606165	Ferrous Iron	<0.1mg/L	~~R~~	~~Missed Holding Time >2days~~
D7-34	9606165	Ferrous Iron	0.2 mg/L	~~J~~	~~Missed Holding Time >2days~~
I3-67	9606165	Ferrous Iron	<0.1mg/L	~~R~~	~~Missed Holding Time >2days~~

DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY
Assigned by Dames & Moore's Data Review Team

DATA QUALIFER DEFINITIONS

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

NJ The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

DATA QUALIFIER DEFINITIONS – REASON CODE DEFINITIONS

a Analytical sequence deficiency or omission.

b Gross compound breakdown (4,4'-DDT/Endrin).

c Calibration failure; poor or unstable response.

d Laboratory duplicate imprecision.

e Laboratory duplicate control sample imprecision.

f Field duplicate imprecision.

g Poor chromatography.

h Holding time violation.

i Internal standard failure.

j Poor mass spectrographic performance.

k Serial dilution imprecision.

l Laboratory control sample recovery failure.

m Matrix spike/matrix spike duplicate recovery failure.

n Interference check sample recovery failure.

o Calibration blank contamination (metals/inorganics only).

p Preparation blank contamination (metals/inorganics only).

q No valid quantitation column present.

r Linearity failure in initial calibration.

s Surrogate spike recovery failure (GC organics and GC/MS organics only).

t Instrument tuning failure.

u No confirmation column present (GC Organics only).

w Retention time (RT) outside of RT window

x Field blank contamination.

y Trip blank contamination

z Method blank contamination.

O Other.

INTERPRETATION KEY

The following example shows how an analytical result which includes qualifiers assigned by both the Dames & Moore data review team and the analytical laboratory could be displayed in the data tables:

<5.20 Uz|JB

The qualifier assigned by the data review team preceeds the "|"; the laboratory qualifier follows it. In this example, the result is qualified as a non-detection due to the bias introduced by contamination of the associated method blank. Presence of the analyte in the method blank is indicated by the laboratory qualifier (B). The qualifier assigned by the Dames & Moore data review team (Uz) indicates that the analyte concentration is considered to be below the adjusted detection limit (quantitation limit) based on the level of contamination in the method blank.

APPENDIX C

APPENDIX C
LABORATORY DATA

LOCKHEED MARTIN

Lockheed Analytical Services

DAMES AND MOORE
CHEVRON

ANALYTICAL DATA REPORT

FOR

METALS, NITRATE, TOTAL DISSOLVED SOLIDS, ALKALINITY, CHLORIDE, SULFATE, VOLATILE AND SEMI VOLATILE ORGANICS

LOG-IN NUMBER: L7305

QUOTATION NUMBER: Q616320

DOCUMENT FILE NUMBER: 0624337

Lockheed Environmental Systems & Technologies Co.
Lockheed Analytical Services
975 Kelly Johnson Drive Las Vegas, Nevada 89119-3705
Telephone 702-361-0220 800-582-7605 Facsimile 702-361-8146

LOCKHEED MARTIN

July 18, 1996

Ms. Lynda Kelly
Dames and Moore
700 Folsum Blvd. Suite 200
Sacramento, CA 95826

RE: Log-in No.: L7305
Quotation No.: Q616320
Document File No.: 0624337

The attached data report contains the analytical results of samples that were submitted to Lockheed Analytical Services on 24 June 1996. The temperature of the coolers upon receipt ranges from 2 through 12°C. The sample containers did not agree with the chain-of-custody documentation. All sample containers were not received intact. Samples were received in time to meet the analytical holding time requirements. All discrepancies (if applicable) identified upon receipt of the samples have been forwarded to the client and are documented in the enclosed chain-of-custody records. (See attached Sample Receiving Checklist for details).

The case narratives included in the following attachments provide a detailed description of all events that occurred during sample preparation, analysis, and data review specific to the samples and analytical methods requested.

A list of data qualifiers, chain-of-custody forms, sample receiving checklist, and log-in report are also enclosed representing the samples received within this group.

If you have any questions concerning the analysis or the data please call Mary B. Ford, Client Services Manager, at (702) 361-3955, extension 326.

Release of this data report has been authorized by the Laboratory Director or the Director's designee as evidenced by the following signature.

Sincerely,

Mary B. Ford 7/19/96

Mary B. Ford
Client Services Manager

cc: Client Services
Document Control

CASE NARRATIVE
INORGANIC NON METALS ANALYSES

The routine calibration and quality control analyses performed for this batch include as applicable: initial and continuing calibration verification, initial and continuing calibration blanks, method blank(s), laboratory control sample(s), matrix spike (predigestion) sample(s), duplicate sample(s).

Preparation and Analysis Requirements

All samples were received on June 24, 1996. The samples were logged in as L7305 and were prepared and analyzed in batch 624 dm and 624 dmx for:

A. Method 160.1 Total Dissolved Solids
B. Method 310.1 Alkalinity
C. Method 325.2 Chloride
D. Method 325.0 Nitrate-Nitrite as Nitrogen
E. Method 375.4 Sulfate

Holding Time Requirements

- All samples were analyzed within the method-specific holding times.

Method Blanks

- The concentration levels of all the requested analytes in the method blank were below the reporting detection limits.

Internal Quality Control

- All Internal Quality Control were within acceptance limits.

Kay McCann
Prepared By

July 5, 1996
Date

CASE NARRATIVE
INORGANIC METALS ANALYSES

The routine calibration and quality control analyses performed for this batch include as applicable: instrument tune (ICP/MS only), initial and continuing calibration verification, initial and continuing calibration blanks, method blank(s), laboratory control sample(s), ICP interference check samples (ICP only), serial dilutions, analytical (post-digestion) spike samples, matrix spike (predigestion) sample(s), and duplicate sample(s).

Preparation and Analysis Requirements

All samples were received on June 24, 1996. The samples were logged in as L7305 and were prepared and analyzed in batch 624 dm for total metals. The samples were analyzed by Method 7000 Furnace metals for arsenic and lead, Method 7470 Mercury, and Method 6010 ICP Metals for all other analytes.

Holding Time Requirements

- All samples were analyzed within the method-specific holding times.

Method Blanks

- The concentration levels of all the requested analytes in the method blank were below the reporting detection limits.

Internal Quality Control

- All Internal Quality Control were within acceptance limits.

Shellee McGrath
Prepared By

July 7, 1996
Date

CASE NARRATIVE
ORGANIC ANALYSES

Analytical Method 8260 Volatile Organics

The associated samples were analyzed in three analytical batches. All instrument tunes, initial and continuing calibrations were within QC criteria. Surrogate recoveries were within QC limits for all samples. The internal standard area counts and retention times were within QC limits for all samples.

Analytical Batch 062896-8260-J-2 (BTEX only, water)

Note: Sample C6-58 (L7305-4) was the native sample used for the 38532MS and 38532MSD analyzed as part of this analytical batch. The 38532MS and 38532MSD were analyzed using a full 8260 compound list.

The Matrix Spike (38532MS), Matrix Spike Duplicate (38532MSD) and Laboratory Control Sample (38532LCS) contained several compounds in addition to the five (5) required spiked compounds.

The samples were analyzed within holding time on June 28 and 29, 1996. No target compounds were detected in the Method Blank (38532MB). All spiked compound recoveries in the 38532MS, 38532MSD and 38532LCS were within QC limits The Relative Percent Differences (RPDs) between the spiked compound recoveries in 38532MS and 38532MSD were all within QC limits.

Analytical Batch 062996-8260-J-2 (Full 8260, water)

Note: Sample C6-R04 (L7305-31) was the native sample used for the 38559MS and 38559MSD analyzed as part of this analytical batch.

The Matrix Spike (38559MS), Matrix Spike Duplicate (38559MSD) and Laboratory Control Sample (38559LCS) contained several compounds in addition to the five (5) required spiked compounds.

The samples were analyzed within holding time on June 29, 1996. The compound Acetone was detected in the Method Blank (38559MB) at a level of 4.1ug/L (practical quantitation limit of 10ug/L). If this compound is detected in any of the associated samples it will be flagged with a "B" qualifier. All spiked compound recoveries in samples 38559MS, 38559MSD and 38559LCS were within QC limits. The RPDs between the spiked compound recoveries in 38559MS and 38559MSD were all within QC limits.

Analytical Batch 063096-8260-J-2 (Full 8260, water)

Note: The 38559MS/38559MSD that was analyzed as part of analytical batch 062996-8260-J-2 (Full 8260, water) is associated with the samples in this analytical batch.

The Laboratory Control Sample (38561LCS) contained several compounds in addition to the five (5) required spiked compounds.

The samples were analyzed within holding time on June 30, 1996. No target compounds were detected in the Method Blank (38561MB). All spiked compound recoveries in 38561LCS were within QC limits.

Analytical Method 8270 Semi-Volatile Organics

The associated samples were analyzed in two analytical batches. The instrument tunes, inititial and continuing calibrations were all within QC limits. There were no target compounds detected in the Method Blanks (38495MB and 38495MB reanalyzed). The internal standard area counts and retention times were within QC limits for all samples.

Analytical Batch 070296-8270-K (water)

Note: Sample C6-RO4 (L7305-107) was the native sample used for 38495MS and 38495MSD analyzed as part of this analytical batch. Samples 38495MS and 38495MSD were analyzed using the duplicate samples C6-RO4 (L7305-108) and C6-RO4 (L7305-109), respectively.

Samples 38495MS, 38495MSD and 38495LCS contained several compounds in addition to the five (5) required spike compounds.

The samples were extracted within holding time on June 27, 1996 and analyzed within holding time on July 2, 1996. Surrogate recoveries were within QC limits for all samples except for 2-Fluorophenol in samples D8-48 (L7305-106) and 38495MB and 2-Fluorophenol and Terphenyl-d14 in client sample I3-67 (L7305-112). Client sample D8-48 (L7305-106) was reanalyzed in this batch with similar results. Samples I3-67(L7305-112) and 38495MB were reanalyzed in analytical batch 070396-8270-K with similar. All analyses resultswere reported in this data package. The recoveries of the spiked compounds in 38495MS, 38495MSD and 38495LCS were all within QC limits (although the recoveries of 1,4-Dichlorobenzene, N-Nitroso-di-propylamine and 1,2,4-Trichlorobenzene were at the low end of the the QC limits in the MS). With the exception of 1,4-Dichlorobenzene, N-Nitroso-di-n-propylamine, the RPDs between the recoveries of the spiked compounds in 38495MS and 38495MSD were within QC limits.

Analytical Batch 070396-8270-K (water)

Note: Refer to analytical batch 070296-8270-K (water) for the associated QC (38495MS, 38495MSD and 38495LCS) results.

The samples were extracted within holding time on June 27, 1996 and analyzed within holding time on July 3, 1996. Surrogate recoveries were within QC limits for all samples except for 2-Fluorophenol and Terphenyl-d14 in the reanalyzed client sample D7-34 (L7305-111) and 2-Fluorophenol in the reanalyzed samples I3-67 (L7305-112) and 38495MB. Only the reanalysis of client sample 07-34 (L7305-111) will be reported in this data package.

Analytical Method 8270 PAHs By SIM

The associated samples were analyzed in three analytical batches. All instrument tunes, initial and continuing calibrations were within QC limits. No target compounds were detected in the Method Blank (original 38459MB and 38459MB reanalyzed)

Analytical Batch 070296-8270-L (SIM, water)

Note: Sample C6-RO4 (L7305-86) was the native sample used for 38459MS and 38459MSD analyzed as part of this analytical batch. The 38459MS and 38495MSD were analyzed using the samples C6-RO4 (L7305-88) and C6-RO4 (L7305-89).

The samples were extracted within holding time on June 26, 1996 and analyzed within holding time on July 2, 1996. Surrogate recoveries were within QC limits for all samples except for 2-Fluorobiphenyl in the 38459MB. This sample was reanalyzed in analytical batch 070396-8270-L (SIM, water) with similar results. All analyses results were reported in this data package. All spiked compound recoveries in the 38459MS, 38459MSD and 38459LCS were within QC limits except for Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Ideno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene and Benzo(g,h,i)perylene in the 38459MS and 38459MSD and Naphthalene in the 38459MSD and 38459LCS. The RPDs between the the spiked compound recoveries in the 38459MS and 38459MSD were all within QC limits. Due to the associated circumstances, the 38459MS, 38459MSD, 38459MB and 38459LCS were reanalyzed in analytical batch 070396-8270-L (SIM, water). All analyses results were reported in this data package. All internal standard area counts and retention times were within QC limits.

Analytical Batch 070396-8270-L (SIM, water)

The samples were extracted within holding time on June 26, 1996 and analyzed within holding time on July 2 and 3, 1996. Surrogate recoveries were within QC limits for all samples except for Nitrobenzene-d5 in client samples D7-33 (L7305-84), D6-R34 (L7305-92) and D7-15 (L7305-98) and 2-Fluorobiphenyl in the reanalyzed 38459MB. All spiked compound recoveries in the reanalyzed reanalyzed 38459MS, 38459MSD, and 38459LCS were within QC limits except for Naphthalene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene and Benzo(g,h,i)perylene in the 38459MS and 38459MSD and Naphthalene in the 38459LCS. The RPDs between the spiked compound recoveries in 38459MS and 38459MSD were all within QC limits. Naphthalene exceeded the calibration range in client sample D6-R34 (L7305-92). Naphthlene and Phenanthrene exceeded the calibration range in client sample D7-15 (L7305-98). Due to the associated circumstances, client samples D7-33 (L7305-84) and D6-R34 (L7305-92) were diluted 1:5 and 1:2 respectively and reanalyzed in this analytical batch. Due to the associated circumstances, client sample D7-15 (L7305-98) was diluted 1:100 and reanalyzed in analytical batch 070896-8270-L (SIM, water). All analyses results were reported in this data package. The internal standard area counts and retention times were within QC limits except for Naphthalene-d8 in client samples D7-33 (L7305-84) and D6-R34 (7305-92) and Perylene-d12 in the reanalyzed 38459LCS.

Analytical Batch 070896-8270-L (SIM, WATER)

Client sample D7-15 (L7305-98) was extracted within holding time on June 26, 1996 and diluted and reanalyzed within holding time on July 8, 1996. Surrogate recoveries were within QC limits for all samples with the exception Nitrobenzene-d5 in client sample D7-15 (L7305-98). The internal standard area counts and retention times were all within QC limits.

Donald A. Hilke
Prepared By

July 18, 1996
Date

Lockheed Analytical Services

DATA QUALIFIERS FOR INORGANIC ANALYSES

[Revised 08/28/92]

For Use on the Analytical Data Reporting Forms	
B	***For CLP Analyses Only*** – Reported value is less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).
C	***For Routine, Non-CLP Analyses Only*** – Any constituent that was also detected in the associated blank whose concentration was greater than the reporting detection limit (RDL).
D	Presence of high levels of interfering constituents required dilution of sample which increased the RDL by the dilution factor.
E	Estimated value due to presence of interference.
H	Sample analysis performed outside of method-or client-specified maximum holding time requirement.
M	***For CLP Analyses Only*** – Duplicate injection precision criterion was not met.
N	Matrix spike recovery exceeded acceptance limits.
S	Reported value was determined from the method of standard addition.
U	***For CLP Reporting Only*** – Constituent was analyzed for but not detected (sample quantitation must be corrected for dilution and percent moisture).
W	***For AAS Only*** – Post-digestion spike for Furnace AAS did not meet acceptance criteria and sample absorbance is less than 50% of spike absorbance.
X, Y, or Z	Analyst-defined qualifier.
*	Relative percent difference (RPD) for duplicate analysis exceeded acceptance limits.
+	Correlation coefficient (r) for the MSA is less than 0.995.
For Use on the QC Data Reporting Forms	
a[1]	The spike recovery and/or RPD for matrix spike and matrix spike duplicates cannot be evaluated due to insufficient spiking level compared to the elevated sample analyte concentration.
b[1]	The RPD cannot be computed because the sample and/or duplicate concentration was below the RDL.

[1]Used as footnote designations on the QC summary form.

Lockheed Analytical Services
DATA QUALIFIERS FOR ORGANIC ANALYSES

[Revised 02/09/1996]

For Use On The Analytical Data Reporting Forms	
A	***For CLP analyses Only*** – The TIC is a suspected aldol-condensation product.
B	Any constituent that was also detected in the associated blank whose concentration was greater than the practical or reporting detection limit (PQL or RDL).
C	Constituent confirmed by GC/MS analysis. *[pesticide/PCB analyses only]*
D	Constituent detected in the diluted sample. It also indicates that an accurate quantitation is not possible due to surrogates being diluted out of the samples during the course of the analysis.
E	Constituent concentration exceeded the calibration range.
G	The quantitation is not gasoline or diesel but believed to be some other combination of hydrocarbons.
H	Sample analysis performed outside of method- or client-specified maximum holding time requirement.
J	*Estimated value* -- (1) constituent detected at a level less than the RDL or PQL and greater than or equal to the MDL; (2) estimated concentration for TICs ***(For CLP Reporting Only)***.
N	***For CLP Reporting Only*** – Tentatively identified constituents (TICs) identified based on mass spectral library search.
NQ	Analyte detected, but Not Quantified; see result from subsequent analysis
P	***For CLP Reporting Only*** – The percent difference between the concentrations detected on both GC columns was greater than 25 percent *[pesticide/PCB analyses only]*.
U	***For CLP Reporting Only*** – Constituent was analyzed for but not detected (sample quantitation must be corrected for dilution and percent moisture).
X, Y, or Z	Analyst-defined qualifier.
N/A (% Moisture)	N/A in the % moisture cell indicates that data are reported on an "*as received*" basis. A value in the % moisture cell indicates that data are reported based on a "*dry weight*" basis.
For Use On The QC Data Reporting Forms	
*	QC data (i.e., percent recovery data for matrix spike, matrix spike duplicate, laboratory control standard, or surrogates; and RPD for matrix spike duplicate or unspiked duplicate) exceeded acceptance limits.
a[1]	The spike recovery and/or RPD for matrix spike and matrix spike duplicates cannot be evaluated due to insufficient spiking level compared to the elevated sample analyte concentration.
b[1]	The RPD cannot be computed because the sample and/or duplicate concentration was below the RDL.

[1] Used as footnote designations on the QC Summary Form.

TABLE OF CONTENTS
GC2 AND GCMS2
FOR SDG/LOG-IN NUMBER L7305

L7305

SAMPLE LOGIN AND CHAIN OF CUSTODY

Revised Login

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:41 pm

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-1	C6-56 ✓	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
Water 1 S 8260 VOLATILES		Hold: 04-JUL-96			
L7305-2	C6-56	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-3	C6-56	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-4 ✓	C6-58 ✓	20-JUN-96	24-JUN-96		04-JUL-96
*MS/MSD ✓ temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
Water 1 S 8260 VOLATILES		Hold: 04-JUL-96			
L7305-5	C6-58	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-6	C6-58	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-7	A3-62 ✓	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
Water 1 S 8260 VOLATILES		Hold: 04-JUL-96			
L7305-8	A3-62	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-9	A3-62	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-10	C6-R37 ✓	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
Water 1 S 8260 VOLATILES		Hold: 04-JUL-96			

* Sample L7305-102 sample B4-61 has been logged in for intrinsic analyses. 6/27/96 MKF

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:41 pm

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number--	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-11	C6-R37	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-12	C6-R37	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-13	C2-64 ✓	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:	04-JUL-96		
L7305-14	C2-64	20-JUN-96	24-JUN-96		04-JUL-96
temp 9;					
Location: RFG18-49C6					
L7305-15	C2-64	20-JUN-96	24-JUN-96		04-JUL-96
temp 9;					
Location: RFG18-49C6					
L7305-16	C7-54 ✓	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:	04-JUL-96		
L7305-17	C7-54	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C6					
L7305-18	C7-54	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C6					
L7305-19	D8-50 ✓	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:	04-JUL-96		
L7305-20	D8-50	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C6					

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:41 pm

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-21	D8-50	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C6					
L7305-22	D8-48 ✓	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:	04-JUL-96		
L7305-23	D8-48	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C6					
L7305-24	D8-48	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C6					
L7305-25	D7-51 ✓	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:	04-JUL-96		
L7305-26	D7-51	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-27	D7-51	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-28	D7-33 ✓	20-JUN-96	24-JUN-96		04-JUL-96
temp 10; REPORT BTEX ONLY					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:	04-JUL-96		
L7305-29	D7-33	20-JUN-96	24-JUN-96		04-JUL-96
temp 10; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-30	D7-33	20-JUN-96	24-JUN-96		04-JUL-96
temp 10; REPORT BTEX ONLY					
Location: RFG18-49C6					

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:41 pm

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number--	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-31	C6-R04	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260	MS/MSD				
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:05-JUL-96			
L7305-32	C6-R04	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260	MS/MSD				
Location: RFG18-49C6					
L7305-33	C6-R04	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260	MS/MSD				
Location: RFG18-49C6					
L7305-34	MS/MSD	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4;					
Location: RFG18-49C6					
Water 1 S NONE		Hold:01-JUL-96			
L7305-35	MS/MSD	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4;					
Location: RFG18-49C6					
Water 1 S NONE		Hold:01-JUL-96			
L7305-36	C6-R36	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:05-JUL-96			
L7305-37	C6-R36	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-38	C6-R36	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-39	D6-R34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:05-JUL-96			
L7305-40	D6-R34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C6					

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:41 pm

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-41	D6-R34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C6					
L7305-42	B8-D1	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:	05-JUL-96		
L7305-43	B8-D1	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-44	B8-D1	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-45	TBS-002	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:	05-JUL-96		
L7305-46	TBS-002	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C6					
L7305-47	TBS-002	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C6					
L7305-48	D7-34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:	05-JUL-96		
L7305-49	D7-34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C6					
L7305-50	D7-34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C6					

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:41 pm

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-51	D7-15	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C4					
Water 1 S 8260	VOLATILES	Hold:05-JUL-96			
L7305-52	D7-15	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C4					
L7305-53	D7-15	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C4					
L7305-54	I3-67	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4;full 8260					
Location: RFG18-49C4					
Water 1 S 8260	VOLATILES	Hold:05-JUL-96			
L7305-55	I3-67	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C4					
L7305-56	I3-67	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C4					
L7305-57	TBS-003	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C4					
Water 1 S 8260	VOLATILES	Hold:05-JUL-96			
L7305-58	TBS-003	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C4					
L7305-59	TBS-003	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C4					
L7305-60	TBS-001	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C4					
Water 1 S 8260	VOLATILES	Hold:04-JUL-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:41 pm

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-61	TBS-001	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C4					
L7305-62	TBS-001	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C4					
L7305-63	B4-61	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C4					
Water 1 S 8260	VOLATILES	Hold: 05-JUL-96			
L7305-64	B4-61	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C4					
L7305-65	B4-61	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C4					
L7305-66	C6-56	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; PAHs ONLY					
Location: EXPENDED					
Water 1 S 8270	SIM	Hold: 27-JUN-96			
L7305-67	C6-56	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; PAHs ONLY					
Location: RFG01-06A					
L7305-68	C6-58	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; PAHs ONLY					
Location: EXPENDED					
Water 1 S 8270	SIM	Hold: 27-JUN-96			
L7305-69	C6-58	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; PAHs ONLY					
Location: RFG01-06A					
L7305-70	A3-62	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; PAHs ONLY					
Location: EXPENDED					
Water 1 S 8270	SIM	Hold: 27-JUN-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
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Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number--	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-71	A3-62	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; PAHs ONLY					
Location: RFG01-06A					
L7305-72	C6-R37	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: EXPENDED					
Water 1 S 8270	SIM	Hold:27-JUN-96			
L7305-73	C6-R37	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06A					
L7305-74	C2-64	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: EXPENDED					
Water 1 S 8270	SIM	Hold:27-JUN-96			
L7305-75	C2-64	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06A					
L7305-76	C7-54	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: EXPENDED					
Water 1 S 8270	SIM	Hold:27-JUN-96			
L7305-77	C7-54	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06A					
L7305-78	D8-50	20-JUN-96	24-JUN-96		04-JUL-96
temp 12; PAHs ONLY					
Location: EXPENDED					
Water 1 S 8270	SIM	Hold:27-JUN-96			
L7305-79	D8-50	20-JUN-96	24-JUN-96		04-JUL-96
temp 12; PAHs ONLY					
Location: RFG01-06A					
L7305-80	D8-48	20-JUN-96	24-JUN-96		04-JUL-96
temp 12; PAHs ONLY					
Location: EXPENDED					
Water 1 S 8270	SIM	Hold:27-JUN-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
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Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-81	D8-48	20-JUN-96	24-JUN-96		04-JUL-96
temp 12; PAHs ONLY					
Location: RFG01-06A					
L7305-82	D7-51	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: EXPENDED					
Water 1 S 8270 SIM		Hold:27-JUN-96			
L7305-83	D7-51	20-JUN-96	24-JUN-96		04-JUL-96
temp 12; PAHs ONLY					
Location: RFG01-06B					
L7305-84	D7-33	20-JUN-96	24-JUN-96		04-JUL-96
temp 10; PAHs ONLY					
Location: EXPENDED					
Water 1 S 8270 SIM		Hold:27-JUN-96			
L7305-85	D7-33	20-JUN-96	24-JUN-96		04-JUL-96
temp 10; PAHs ONLY					
Location: RFG01-06B					
L7305-86	C6-R04	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY MS/MSD					
Location: EXPENDED					
Water 1 S 8270 SIM		Hold:28-JUN-96			
L7305-87	C6-R04	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06B					
L7305-88	MS/MSD	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: EXPENDED					
Water 1 S NONE		Hold:01-JUL-96			
L7305-89	MS/MSD	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: EXPENDED					
Water 1 S NONE		Hold:01-JUL-96			
L7305-90	C6-R36	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: EXPENDED					

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:41 pm

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
Water 1 S 8270 SIM		Hold:28-JUN-96			
L7305-91 temp 2to4; PAHs ONLY Location: RFG01-06B	C6-R36	21-JUN-96	24-JUN-96		04-JUL-96
L7305-92 temp 2to4; PAHs ONLY Location: EXPENDED	D6-R34 ✓	21-JUN-96	24-JUN-96		04-JUL-96
Water 1 S 8270 SIM		Hold:28-JUN-96			
L7305-93 temp 2to4; PAHs ONLY Location: RFG01-06B	D6-R34	21-JUN-96	24-JUN-96		04-JUL-96
L7305-94 temp 2to4; PAHs ONLY Location: EXPENDED	B8-D1 ✓	21-JUN-96	24-JUN-96		04-JUL-96
Water 1 S 8270 SIM		Hold:28-JUN-96			
L7305-95 temp 2to4; PAHs ONLY Location: RFG01-06B	B8-D1	21-JUN-96	24-JUN-96		04-JUL-96
L7305-96 temp 2to4; PAHs ONLY Location: EXPENDED	D7-34 ✓	21-JUN-96	24-JUN-96		04-JUL-96
Water 1 S 8270 SIM		Hold:28-JUN-96			
L7305-97 temp 2to4; PAHs ONLY Location: RFG01-06B	D7-34	21-JUN-96	24-JUN-96		04-JUL-96
L7305-98 temp 2to4; PAHs ONLY Location: EXPENDED	D7-15 ✓	21-JUN-96	24-JUN-96		04-JUL-96
Water 1 S 8270 SIM		Hold:28-JUN-96			
L7305-99 temp 2to4; PAHs ONLY Location: EXPENDED	I3-67 ✓	21-JUN-96	24-JUN-96		04-JUL-96
Water 1 S 8270 SIM		Hold:28-JUN-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
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Login Number: L7305
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Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-100	I3-67	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06B					
L7305-101	B4-61	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: EXPENDED					
Water 1 S 8270	SIM	Hold:28-JUN-96			
L7305-102	B4-61	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4;					
Location: RFG01-06B					
Water 1 S 160.1	TDS	Hold:28-JUN-96			
Water 1 S 310.1	ALKALINITY	Hold:05-JUL-96			
Water 1 S 325.2	CHLORIDE	Hold:19-JUL-96			
Water 1 S 375.4	SULFATE	Hold:19-JUL-96			
L7305-103	C2-64	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; "J" FLAG					
Location: RFG01-06B					
Water 1 S 8270	SEMI-VOLATILES	Hold:27-JUN-96			
L7305-104	C7-54	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; "J" FLAG					
Location: RFG01-06B					
Water 1 S 8270	SEMI-VOLATILES	Hold:27-JUN-96			
L7305-105	D8-50	20-JUN-96	24-JUN-96		04-JUL-96
temp 12; "J" FLAG					
Location: RFG01-06B					
Water 1 S 8270	SEMI-VOLATILES	Hold:27-JUN-96			
L7305-106	D8-48	20-JUN-96	24-JUN-96		04-JUL-96
temp 12; "J" FLAG					
Location: RFG01-06B					
Water 1 S 8270	SEMI-VOLATILES	Hold:27-JUN-96			
L7305-107	C6-R04	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; "J" FLAG	MS/MSD				
Location: RFG01-06B					
Water 1 S 8270	SEMI-VOLATILES	Hold:28-JUN-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
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Login Number: L7305
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Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-108	MS/MSD	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; "J" FLAG					
Location: RFG01-06B					
Water 1 S NONE		Hold:01-JUL-96			
L7305-109	MS/MSD	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; "J" FLAG					
Location: RFG01-06B					
Water 1 S NONE		Hold:01-JUL-96			
L7305-110	D6-R34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; "J" FLAG					
Location: RFG01-06B					
Water 1 S 8270	SEMI-VOLATILES	Hold:28-JUN-96			
L7305-111	D7-34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; "J" FLAG					
Location: RFG01-06B					
Water 1 S 8270	SEMI-VOLATILES	Hold:28-JUN-96			
L7305-112	I3-67	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; "J" FLAG					
Location: RFG01-06B					
Water 1 S 8270	SEMI-VOLATILES	Hold:28-JUN-96			
L7305-113	C6-56	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-06B					
Water 1 S 6010	ICP METALS	Hold:17-DEC-96			
Water 1 S 6010	ICP TRACE	Hold:17-DEC-96			
Water 1 S 7000	FURNACE METALS	Hold:17-DEC-96			
Water 1 S 7470	MERCURY	Hold:18-JUL-96			
L7305-114	C6-58	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-06B					
Water 1 S 6010	ICP METALS	Hold:17-DEC-96			
Water 1 S 6010	ICP TRACE	Hold:17-DEC-96			
Water 1 S 7000	FURNACE METALS	Hold:17-DEC-96			
Water 1 S 7470	MERCURY	Hold:18-JUL-96			
L7305-115	A3-62	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-06B					

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:41 pm

Login Number: L7305
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Laboratory Sample Number			Client Sample Number	Collect Date	Receive Date	PR	Due Date
Water	1	S 6010	ICP METALS	Hold:17-DEC-96			
Water	1	S 6010	ICP TRACE	Hold:17-DEC-96			
Water	1	S 7000	FURNACE METALS	Hold:17-DEC-96			
Water	1	S 7470	MERCURY	Hold:18-JUL-96			
L7305-116			C6-R37	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V							
Location: RFG01-06B							
Water	1	S 6010	ICP METALS	Hold:17-DEC-96			
Water	1	S 6010	ICP TRACE	Hold:17-DEC-96			
Water	1	S 7000	FURNACE METALS	Hold:17-DEC-96			
Water	1	S 7470	MERCURY	Hold:18-JUL-96			
L7305-117			C2-64	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V							
Location: RFG01-06B							
Water	1	S 6010	ICP METALS	Hold:17-DEC-96			
Water	1	S 6010	ICP TRACE	Hold:17-DEC-96			
Water	1	S 7000	FURNACE METALS	Hold:17-DEC-96			
Water	1	S 7470	MERCURY	Hold:18-JUL-96			
L7305-118			C7-54	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V							
Location: RFG01-06B							
Water	1	S 6010	ICP METALS	Hold:17-DEC-96			
Water	1	S 6010	ICP TRACE	Hold:17-DEC-96			
Water	1	S 7000	FURNACE METALS	Hold:17-DEC-96			
Water	1	S 7470	MERCURY	Hold:18-JUL-96			
L7305-119			D8-50	20-JUN-96	24-JUN-96		04-JUL-96
temp 12; METALS=As,Cd,Cr,Pb,Ni,V							
Location: RFG01-06B							
Water	1	S 6010	ICP METALS	Hold:17-DEC-96			
Water	1	S 6010	ICP TRACE	Hold:17-DEC-96			
Water	1	S 7000	FURNACE METALS	Hold:17-DEC-96			
Water	1	S 7470	MERCURY	Hold:18-JUL-96			
L7305-120			D8-48	20-JUN-96	24-JUN-96		04-JUL-96
temp 12; METALS=As,Cd,Cr,Pb,Ni,V							
Location: RFG01-06B							
Water	1	S 6010	ICP METALS	Hold:17-DEC-96			
Water	1	S 6010	ICP TRACE	Hold:17-DEC-96			
Water	1	S 7000	FURNACE METALS	Hold:17-DEC-96			
Water	1	S 7470	MERCURY	Hold:18-JUL-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:41 pm

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-121	D7-51	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-06B					
Water 1 S 6010	ICP METALS	Hold:17-DEC-96			
Water 1 S 6010	ICP TRACE	Hold:17-DEC-96			
Water 1 S 7000	FURNACE METALS	Hold:17-DEC-96			
Water 1 S 7470	MERCURY	Hold:18-JUL-96			
L7305-122	D7-33	20-JUN-96	24-JUN-96		04-JUL-96
temp 10; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-06B					
Water 1 S 6010	ICP METALS	Hold:17-DEC-96			
Water 1 S 6010	ICP TRACE	Hold:17-DEC-96			
Water 1 S 7000	FURNACE METALS	Hold:17-DEC-96			
Water 1 S 7470	MERCURY	Hold:18-JUL-96			
L7305-123	C6-R04	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V	MS/MSD				
Location: RFG01-06B					
Water 1 S 6010	ICP METALS	Hold:18-DEC-96			
Water 1 S 6010	ICP TRACE	Hold:18-DEC-96			
Water 1 S 7000	FURNACE METALS	Hold:18-DEC-96			
Water 1 S 7470	MERCURY	Hold:19-JUL-96			
L7305-124	MS/MSD	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-06B					
Water 1 S NONE		Hold:01-JUL-96			
L7305-125	C6-R36	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-06B					
Water 1 S 6010	ICP METALS	Hold:18-DEC-96			
Water 1 S 6010	ICP TRACE	Hold:18-DEC-96			
Water 1 S 7000	FURNACE METALS	Hold:18-DEC-96			
Water 1 S 7470	MERCURY	Hold:19-JUL-96			
L7305-126	D6-R34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-06B					
Water 1 S 6010	ICP METALS	Hold:18-DEC-96			
Water 1 S 6010	ICP TRACE	Hold:18-DEC-96			
Water 1 S 7000	FURNACE METALS	Hold:18-DEC-96			
Water 1 S 7470	MERCURY	Hold:19-JUL-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:41 pm

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-127	B8-D1	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-06B					
Water 1 S 6010 ICP METALS		Hold:18-DEC-96			
Water 1 S 6010 ICP TRACE		Hold:18-DEC-96			
Water 1 S 7000 FURNACE METALS		Hold:18-DEC-96			
Water 1 S 7470 MERCURY		Hold:19-JUL-96			
L7305-128	D7-34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-01B					
Water 1 S 6010 ICP METALS		Hold:18-DEC-96			
Water 1 S 6010 ICP TRACE		Hold:18-DEC-96			
Water 1 S 7000 FURNACE METALS		Hold:18-DEC-96			
Water 1 S 7470 MERCURY		Hold:19-JUL-96			
L7305-129	D7-15	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-01B					
Water 1 S 6010 ICP METALS		Hold:18-DEC-96			
Water 1 S 6010 ICP TRACE		Hold:18-DEC-96			
Water 1 S 7000 FURNACE METALS		Hold:18-DEC-96			
Water 1 S 7470 MERCURY		Hold:19-JUL-96			
L7305-130	I3-67	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-01B					
Water 1 S 6010 ICP METALS		Hold:18-DEC-96			
Water 1 S 6010 ICP TRACE		Hold:18-DEC-96			
Water 1 S 7000 FURNACE METALS		Hold:18-DEC-96			
Water 1 S 7470 MERCURY		Hold:19-JUL-96			
L7305-131	B4-61	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-01B					
Water 1 S 6010 ICP METALS		Hold:18-DEC-96			
Water 1 S 6010 ICP TRACE		Hold:18-DEC-96			
Water 1 S 7000 FURNACE METALS		Hold:18-DEC-96			
Water 1 S 7470 MERCURY		Hold:19-JUL-96			
L7305-132	C6-56	20-JUN-96	24-JUN-96		04-JUL-96
temp 9					
Location: 121					
Water 1 S 353.2 NITRATE		Hold:18-JUL-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:41 pm

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-133	C6-58	20-JUN-96	24-JUN-96		04-JUL-96
temp 9					
Location: 121					
Water 1 S 353.2 NITRATE		Hold:18-JUL-96			
L7305-134	A3-62	20-JUN-96	24-JUN-96		04-JUL-96
temp 9					
Location: 121					
Water 1 S 353.2 NITRATE		Hold:18-JUL-96			
L7305-135	C6-R37	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: 121					
Water 1 S 353.2 NITRATE		Hold:18-JUL-96			
L7305-136	C2-64	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: 121					
Water 1 S 353.2 NITRATE		Hold:18-JUL-96			
L7305-137	C7-54	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: 121					
Water 1 S 353.2 NITRATE		Hold:18-JUL-96			
L7305-138	D8-50	20-JUN-96	24-JUN-96		04-JUL-96
temp 12					
Location: 121					
Water 1 S 353.2 NITRATE		Hold:18-JUL-96			
L7305-139	D8-48	20-JUN-96	24-JUN-96		04-JUL-96
temp 12					
Location: 121					
Water 1 S 353.2 NITRATE		Hold:18-JUL-96			
L7305-140	D7-51	20-JUN-96	24-JUN-96		04-JUL-96
temp 12					
Location: 121					
Water 1 S 353.2 NITRATE		Hold:18-JUL-96			
L7305-141	D7-33	20-JUN-96	24-JUN-96		04-JUL-96
temp 10					
Location: 121					
Water 1 S 353.2 NITRATE		Hold:18-JUL-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:41 pm

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-142	C6-R04	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4 MS/MSD					
Location: 121					
Water 1 S 353.2 NITRATE		Hold:19-JUL-96			
L7305-143	MS/MSD	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: RFG01-01B					
Water 1 S NONE		Hold:01-JUL-96			
L7305-144	C6-R36	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: 121					
Water 1 S 353.2 NITRATE		Hold:19-JUL-96			
L7305-145	D6-R34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: 121					
Water 1 S 353.2 NITRATE		Hold:19-JUL-96			
L7305-146	B8-D1	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: 121					
Water 1 S 353.2 NITRATE		Hold:19-JUL-96			
L7305-147	D7-34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: 121					
Water 1 S 353.2 NITRATE		Hold:19-JUL-96			
L7305-148	D7-15	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: 121					
Water 1 S 353.2 NITRATE		Hold:19-JUL-96			
L7305-149	I3-67	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: RFG01-01B					
Water 1 S 353.2 NITRATE		Hold:19-JUL-96			
L7305-150	B4-61	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: 121					
Water 1 S 353.2 NITRATE		Hold:19-JUL-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:41 pm

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number			Client Sample Number		Collect Date	Receive Date	PR	Due Date
L7305-151			C6-56		20-JUN-96	24-JUN-96		04-JUL-96
temp 9								
Location: 133								
Water	1	S	160.1	TDS	Hold:27-JUN-96			
Water	1	S	310.1	ALKALINITY	Hold:04-JUL-96			
Water	1	S	325.2	CHLORIDE	Hold:18-JUL-96			
Water	1	S	375.4	SULFATE	Hold:18-JUL-96			
L7305-152			C6-58		20-JUN-96	24-JUN-96		04-JUL-96
temp 9								
Location: 133								
Water	1	S	160.1	TDS	Hold:27-JUN-96			
Water	1	S	310.1	ALKALINITY	Hold:04-JUL-96			
Water	1	S	325.2	CHLORIDE	Hold:18-JUL-96			
Water	1	S	375.4	SULFATE	Hold:18-JUL-96			
L7305-153			A3-62		20-JUN-96	24-JUN-96		04-JUL-96
temp 9								
Location: 133								
Water	1	S	160.1	TDS	Hold:27-JUN-96			
Water	1	S	310.1	ALKALINITY	Hold:04-JUL-96			
Water	1	S	325.2	CHLORIDE	Hold:18-JUL-96			
Water	1	S	375.4	SULFATE	Hold:18-JUL-96			
L7305-154			C6-R37		20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4								
Location: 133								
Water	1	S	160.1	TDS	Hold:27-JUN-96			
Water	1	S	310.1	ALKALINITY	Hold:04-JUL-96			
Water	1	S	325.2	CHLORIDE	Hold:18-JUL-96			
Water	1	S	375.4	SULFATE	Hold:18-JUL-96			
L7305-155			C2-64		20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4								
Location: 133								
Water	1	S	160.1	TDS	Hold:27-JUN-96			
Water	1	S	310.1	ALKALINITY	Hold:04-JUL-96			
Water	1	S	325.2	CHLORIDE	Hold:18-JUL-96			
Water	1	S	375.4	SULFATE	Hold:18-JUL-96			
L7305-156			C7-54		20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4								
Location: 133								
Water	1	S	160.1	TDS	Hold:27-JUN-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:41 pm

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number			Client Sample Number		Collect Date	Receive Date	PR	Due Date
Water	1	S	310.1	ALKALINITY	Hold:04-JUL-96			
Water	1	S	325.2	CHLORIDE	Hold:18-JUL-96			
Water	1	S	375.4	SULFATE	Hold:18-JUL-96			
L7305-157			D8-50		20-JUN-96	24-JUN-96		04-JUL-96
temp 12								
Location: 133								
Water	1	S	160.1	TDS	Hold:27-JUN-96			
Water	1	S	310.1	ALKALINITY	Hold:04-JUL-96			
Water	1	S	325.2	CHLORIDE	Hold:18-JUL-96			
Water	1	S	375.4	SULFATE	Hold:18-JUL-96			
L7305-158			D8-48		20-JUN-96	24-JUN-96		04-JUL-96
temp 12								
Location: 133								
Water	1	S	160.1	TDS	Hold:27-JUN-96			
Water	1	S	310.1	ALKALINITY	Hold:04-JUL-96			
Water	1	S	325.2	CHLORIDE	Hold:18-JUL-96			
Water	1	S	375.4	SULFATE	Hold:18-JUL-96			
L7305-159			D7-51		20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4								
Location: 133								
Water	1	S	160.1	TDS	Hold:27-JUN-96			
Water	1	S	310.1	ALKALINITY	Hold:04-JUL-96			
Water	1	S	325.2	CHLORIDE	Hold:18-JUL-96			
Water	1	S	375.4	SULFATE	Hold:18-JUL-96			
L7305-160			D7-33		20-JUN-96	24-JUN-96		04-JUL-96
temp 10								
Location: 133								
Water	1	S	160.1	TDS	Hold:27-JUN-96			
Water	1	S	310.1	ALKALINITY	Hold:04-JUL-96			
Water	1	S	325.2	CHLORIDE	Hold:18-JUL-96			
Water	1	S	375.4	SULFATE	Hold:18-JUL-96			
L7305-161			C6-R04		21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4	MS/MSD							
Location: 133								
Water	1	S	160.1	TDS	Hold:28-JUN-96			
Water	1	S	310.1	ALKALINITY	Hold:05-JUL-96			
Water	1	S	325.2	CHLORIDE	Hold:19-JUL-96			
Water	1	S	375.4	SULFATE	Hold:19-JUL-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:41 pm

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number			Client Sample Number		Collect Date	Receive Date	PR	Due Date
L7305-162			MS/MSD		21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4								
Location: 133								
Water	1	S	NONE		Hold:01-JUL-96			
L7305-163			C6-R36		21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4								
Location: 133								
Water	1	S	160.1	TDS	Hold:28-JUN-96			
Water	1	S	310.1	ALKALINITY	Hold:05-JUL-96			
Water	1	S	325.2	CHLORIDE	Hold:19-JUL-96			
Water	1	S	375.4	SULFATE	Hold:19-JUL-96			
L7305-164			D6-R34		21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4								
Location: 133								
Water	1	S	160.1	TDS	Hold:28-JUN-96			
Water	1	S	310.1	ALKALINITY	Hold:05-JUL-96			
Water	1	S	325.2	CHLORIDE	Hold:19-JUL-96			
Water	1	S	375.4	SULFATE	Hold:19-JUL-96			
L7305-165			B8-D1		21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4								
Location: 133								
Water	1	S	160.1	TDS	Hold:28-JUN-96			
Water	1	S	310.1	ALKALINITY	Hold:05-JUL-96			
Water	1	S	325.2	CHLORIDE	Hold:19-JUL-96			
Water	1	S	375.4	SULFATE	Hold:19-JUL-96			
L7305-166			D7-34		21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4								
Location: 133								
Water	1	S	160.1	TDS	Hold:28-JUN-96			
Water	1	S	310.1	ALKALINITY	Hold:05-JUL-96			
Water	1	S	325.2	CHLORIDE	Hold:19-JUL-96			
Water	1	S	375.4	SULFATE	Hold:19-JUL-96			
L7305-167			D7-15		21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4								
Location: 133								
Water	1	S	160.1	TDS	Hold:28-JUN-96			
Water	1	S	310.1	ALKALINITY	Hold:05-JUL-96			
Water	1	S	325.2	CHLORIDE	Hold:19-JUL-96			
Water	1	S	375.4	SULFATE	Hold:19-JUL-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:41 pm

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number			Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-168			I3-67	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4							
Location: 133							
Water	1	S	160.1 TDS ✓	Hold:28-JUN-96			
Water	1	S	310.1 ALKALINITY ✓	Hold:05-JUL-96			
Water	1	S	325.2 CHLORIDE ✓	Hold:19-JUL-96			
Water	1	S	375.4 SULFATE ✓	Hold:19-JUL-96			
L7305-169			REPORT TYPE	24-JUN-96	24-JUN-96		04-JUL-96
Location:							
Water	1	S	EDD - DISK DEL.				
Water	1	S	GCMS2				
Water	1	S	INORG TYPE 2 RPT				

Signature: Mary P. Ford

Date: 6/27/96

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 26 1996, 08:40 am

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-1	C6-56	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
Water 1 S 8260 VOLATILES		Hold:04-JUL-96			
L7305-2	C6-56	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-3	C6-56	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-4	C6-58	20-JUN-96	24-JUN-96		04-JUL-96
*MS/MSD temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
Water 1 S 8260 VOLATILES		Hold:04-JUL-96			
L7305-5	C6-58	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-6	C6-58	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-7	A3-62	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
Water 1 S 8260 VOLATILES		Hold:04-JUL-96			
L7305-8	A3-62	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-9	A3-62	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-10	C6-R37	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
Water 1 S 8260 VOLATILES		Hold:04-JUL-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 26 1996, 08:40 am

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-11	C6-R37	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-12	C6-R37	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-13	C2-64	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:04-JUL-96			
L7305-14	C2-64	20-JUN-96	24-JUN-96		04-JUL-96
temp 9;					
Location: RFG18-49C6					
L7305-15	C2-64	20-JUN-96	24-JUN-96		04-JUL-96
temp 9;					
Location: RFG18-49C6					
L7305-16	C7-54	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:04-JUL-96			
L7305-17	C7-54	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C6					
L7305-18	C7-54	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C6					
L7305-19	D8-50	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:04-JUL-96			
L7305-20	D8-50	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C6					

GW4337

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 26 1996, 08:40 am

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-21	D8-50	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C6					
L7305-22	D8-48	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:04-JUL-96			
L7305-23	D8-48	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C6					
L7305-24	D8-48	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C6					
L7305-25	D7-51	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:04-JUL-96			
L7305-26	D7-51	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-27	D7-51	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-28	D7-33	20-JUN-96	24-JUN-96		04-JUL-96
temp 10; REPORT BTEX ONLY					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:04-JUL-96			
L7305-29	D7-33	20-JUN-96	24-JUN-96		04-JUL-96
temp 10; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-30	D7-33	20-JUN-96	24-JUN-96		04-JUL-96
temp 10; REPORT BTEX ONLY					
Location: RFG18-49C6					

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 26 1996, 08:40 am

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-31	C6-R04	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260	MS/MSD				
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:05-JUL-96			
L7305-32	C6-R04	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260	MS/MSD				
Location: RFG18-49C6					
L7305-33	C6-R04	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260	MS/MSD				
Location: RFG18-49C6					
L7305-34	MS/MSD	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4;					
Location: RFG18-49C6					
Water 1 S NONE		Hold:01-JUL-96			
L7305-35	MS/MSD	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4;					
Location: RFG18-49C6					
Water 1 S NONE		Hold:01-JUL-96			
L7305-36	C6-R36	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:05-JUL-96			
L7305-37	C6-R36	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-38	C6-R36	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-39	D6-R34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:05-JUL-96			
L7305-40	D6-R34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C6					

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 26 1996, 08:40 am

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-41	D6-R34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C6					
L7305-42	B8-D1	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:05-JUL-96			
L7305-43	B8-D1	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-44	B8-D1	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C6					
L7305-45	TBS-002	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:05-JUL-96			
L7305-46	TBS-002	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C6					
L7305-47	TBS-002	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C6					
L7305-48	D7-34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C6					
Water 1 S 8260	VOLATILES	Hold:05-JUL-96			
L7305-49	D7-34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C6					
L7305-50	D7-34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C6					

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 26 1996, 08:40 am

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-51	D7-15	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C4					
Water 1 S 8260	VOLATILES	Hold:	05-JUL-96		
L7305-52	D7-15	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C4					
L7305-53	D7-15	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C4					
L7305-54	I3-67	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4;full 8260					
Location: RFG18-49C4					
Water 1 S 8260	VOLATILES	Hold:	05-JUL-96		
L7305-55	I3-67	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C4					
L7305-56	I3-67	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C4					
L7305-57	TBS-003	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C4					
Water 1 S 8260	VOLATILES	Hold:	05-JUL-96		
L7305-58	TBS-003	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C4					
L7305-59	TBS-003	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; full 8260					
Location: RFG18-49C4					
L7305-60	TBS-001	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C4					
Water 1 S 8260	VOLATILES	Hold:	04-JUL-96		

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 26 1996, 08:40 am

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-61	TBS-001	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C4					
L7305-62	TBS-001	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; full 8260					
Location: RFG18-49C4					
L7305-63	B4-61	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C4					
Water 1 S 8260	VOLATILES	Hold:	05-JUL-96		
L7305-64	B4-61	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C4					
L7305-65	B4-61	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; REPORT BTEX ONLY					
Location: RFG18-49C4					
L7305-66	C6-56	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; PAHs ONLY					
Location: RFG01-06A					
Water 1 S 8270	SIM	Hold:	27-JUN-96		
L7305-67	C6-56	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; PAHs ONLY					
Location: RFG01-06A					
L7305-68	C6-58	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; PAHs ONLY					
Location: RFG01-06A					
Water 1 S 8270	SIM	Hold:	27-JUN-96		
L7305-69	C6-58	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; PAHs ONLY					
Location: RFG01-06A					
L7305-70	A3-62	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; PAHs ONLY					
Location: RFG01-06A					
Water 1 S 8270	SIM	Hold:	27-JUN-96		

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 26 1996, 08:40 am

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-71	A3-62	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; PAHs ONLY					
Location: RFG01-06A					
L7305-72	C6-R37	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06A					
Water 1 S 8270	SIM	Hold:27-JUN-96			
L7305-73	C6-R37	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06A					
L7305-74	C2-64	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06A					
Water 1 S 8270	SIM	Hold:27-JUN-96			
L7305-75	C2-64	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06A					
L7305-76	C7-54	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06A					
Water 1 S 8270	SIM	Hold:27-JUN-96			
L7305-77	C7-54	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06A					
L7305-78	D8-50	20-JUN-96	24-JUN-96		04-JUL-96
temp 12; PAHs ONLY					
Location: RFG01-06A					
Water 1 S 8270	SIM	Hold:27-JUN-96			
L7305-79	D8-50	20-JUN-96	24-JUN-96		04-JUL-96
temp 12; PAHs ONLY					
Location: RFG01-06A					
L7305-80	D8-48	20-JUN-96	24-JUN-96		04-JUL-96
temp 12; PAHs ONLY					
Location: RFG01-06A					
Water 1 S 8270	SIM	Hold:27-JUN-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 26 1996, 08:40 am

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-81	D8-48	20-JUN-96	24-JUN-96		04-JUL-96
temp 12; PAHs ONLY					
Location: RFG01-06A					
L7305-82	D7-51	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06A					
Water 1 S 8270	SIM	Hold:	27-JUN-96		
L7305-83	D7-51	20-JUN-96	24-JUN-96		04-JUL-96
temp 12; PAHs ONLY					
Location: RFG01-06B					
L7305-84	D7-33	20-JUN-96	24-JUN-96		04-JUL-96
temp 10; PAHs ONLY					
Location: RFG01-06B					
Water 1 S 8270	SIM	Hold:	27-JUN-96		
L7305-85	D7-33	20-JUN-96	24-JUN-96		04-JUL-96
temp 10; PAHs ONLY					
Location: RFG01-06B					
L7305-86	C6-R04	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY	MS/MSD				
Location: RFG01-06B					
Water 1 S 8270	SIM	Hold:	28-JUN-96		
L7305-87	C6-R04	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06B					
L7305-88	MS/MSD	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06B					
Water 1 S NONE		Hold:	01-JUL-96		
L7305-89	MS/MSD	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06B					
Water 1 S NONE		Hold:	01-JUL-96		
L7305-90	C6-R36	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06B					

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 26 1996, 08:40 am

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
Water 1 S 8270 SIM		Hold:28-JUN-96			
L7305-91	C6-R36	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06B					
L7305-92	D6-R34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06B					
Water 1 S 8270 SIM		Hold:28-JUN-96			
L7305-93	D6-R34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06B					
L7305-94	B8-D1	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06B					
Water 1 S 8270 SIM		Hold:28-JUN-96			
L7305-95	B8-D1	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06B					
L7305-96	D7-34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06B					
Water 1 S 8270 SIM		Hold:28-JUN-96			
L7305-97	D7-34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06B					
L7305-98	D7-15	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06B					
Water 1 S 8270 SIM		Hold:28-JUN-96			
L7305-99	I3-67	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06B					
Water 1 S 8270 SIM		Hold:28-JUN-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 26 1996, 08:40 am

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-100	I3-67	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06B					
L7305-101	B4-61	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06B					
Water 1 S 8270	SIM	Hold:	28-JUN-96		
L7305-102	B4-61	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; PAHs ONLY					
Location: RFG01-06B					
L7305-103	C2-64	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; "J" FLAG					
Location: RFG01-06B					
Water 1 S 8270	SEMI-VOLATILES	Hold:	27-JUN-96		
L7305-104	C7-54	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; "J" FLAG					
Location: RFG01-06B					
Water 1 S 8270	SEMI-VOLATILES	Hold:	27-JUN-96		
L7305-105	D8-50	20-JUN-96	24-JUN-96		04-JUL-96
temp 12; "J" FLAG					
Location: RFG01-06B					
Water 1 S 8270	SEMI-VOLATILES	Hold:	27-JUN-96		
L7305-106	D8-48	20-JUN-96	24-JUN-96		04-JUL-96
temp 12; "J" FLAG					
Location: RFG01-06B					
Water 1 S 8270	SEMI-VOLATILES	Hold:	27-JUN-96		
L7305-107	C6-R04	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; "J" FLAG	MS/MSD				
Location: RFG01-06B					
Water 1 S 8270	SEMI-VOLATILES	Hold:	28-JUN-96		
L7305-108	MS/MSD	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; "J" FLAG					
Location: RFG01-06B					
Water 1 S NONE		Hold:	01-JUL-96		

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 26 1996, 08:40 am

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-109	MS/MSD	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; "J" FLAG					
Location: RFG01-06B					
Water 1 S NONE		Hold:01-JUL-96			
L7305-110	D6-R34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; "J" FLAG					
Location: RFG01-06B					
Water 1 S 8270	SEMI-VOLATILES	Hold:28-JUN-96			
L7305-111	D7-34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; "J" FLAG					
Location: RFG01-06B					
Water 1 S 8270	SEMI-VOLATILES	Hold:28-JUN-96			
L7305-112	I3-67	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; "J" FLAG					
Location: RFG01-06B					
Water 1 S 8270	SEMI-VOLATILES	Hold:28-JUN-96			
L7305-113	C6-56	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-06B					
Water 1 S 6010	ICP METALS	Hold:17-DEC-96			
Water 1 S 6010	ICP TRACE	Hold:17-DEC-96			
Water 1 S 7470	MERCURY	Hold:18-JUL-96			
L7305-114	C6-58	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-06B					
Water 1 S 6010	ICP METALS	Hold:17-DEC-96			
Water 1 S 6010	ICP TRACE	Hold:17-DEC-96			
Water 1 S 7470	MERCURY	Hold:18-JUL-96			
L7305-115	A3-62	20-JUN-96	24-JUN-96		04-JUL-96
temp 9; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-06B					
Water 1 S 6010	ICP METALS	Hold:17-DEC-96			
Water 1 S 6010	ICP TRACE	Hold:17-DEC-96			
Water 1 S 7470	MERCURY	Hold:18-JUL-96			
L7305-116	C6-R37	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-06B					

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LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 26 1996, 08:40 am

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number			Client Sample Number	Collect Date	Receive Date	PR	Due Date
Water	1	S 6010	ICP METALS	Hold:17-DEC-96			
Water	1	S 6010	ICP TRACE	Hold:17-DEC-96			
Water	1	S 7470	MERCURY	Hold:18-JUL-96			
L7305-117			C2-64	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V							
Location: RFG01-06B							
Water	1	S 6010	ICP METALS	Hold:17-DEC-96			
Water	1	S 6010	ICP TRACE	Hold:17-DEC-96			
Water	1	S 7470	MERCURY	Hold:18-JUL-96			
L7305-118			C7-54	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V							
Location: RFG01-06B							
Water	1	S 6010	ICP METALS	Hold:17-DEC-96			
Water	1	S 6010	ICP TRACE	Hold:17-DEC-96			
Water	1	S 7470	MERCURY	Hold:18-JUL-96			
L7305-119			D8-50	20-JUN-96	24-JUN-96		04-JUL-96
temp 12; METALS=As,Cd,Cr,Pb,Ni,V							
Location: RFG01-06B							
Water	1	S 6010	ICP METALS	Hold:17-DEC-96			
Water	1	S 6010	ICP TRACE	Hold:17-DEC-96			
Water	1	S 7470	MERCURY	Hold:18-JUL-96			
L7305-120			D8-48	20-JUN-96	24-JUN-96		04-JUL-96
temp 12; METALS=As,Cd,Cr,Pb,Ni,V							
Location: RFG01-06B							
Water	1	S 6010	ICP METALS	Hold:17-DEC-96			
Water	1	S 6010	ICP TRACE	Hold:17-DEC-96			
Water	1	S 7470	MERCURY	Hold:18-JUL-96			
L7305-121			D7-51	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V							
Location: RFG01-06B							
Water	1	S 6010	ICP METALS	Hold:17-DEC-96			
Water	1	S 6010	ICP TRACE	Hold:17-DEC-96			
Water	1	S 7470	MERCURY	Hold:18-JUL-96			
L7305-122			D7-33	20-JUN-96	24-JUN-96		04-JUL-96
temp 10; METALS=As,Cd,Cr,Pb,Ni,V							
Location: RFG01-06B							
Water	1	S 6010	ICP METALS	Hold:17-DEC-96			
Water	1	S 6010	ICP TRACE	Hold:17-DEC-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 26 1996, 08:40 am

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
Water 1 S 7470 MERCURY		Hold:18-JUL-96			
L7305-123	C6-R04	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V		MS/MSD			
Location: RFG01-06B					
Water 1 S 6010 ICP METALS		Hold:18-DEC-96			
Water 1 S 6010 ICP TRACE		Hold:18-DEC-96			
Water 1 S 7470 MERCURY		Hold:19-JUL-96			
L7305-124	MS/MSD	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-06B					
Water 1 S NONE		Hold:01-JUL-96			
L7305-125	C6-R36	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-06B					
Water 1 S 6010 ICP METALS		Hold:18-DEC-96			
Water 1 S 6010 ICP TRACE		Hold:18-DEC-96			
Water 1 S 7470 MERCURY		Hold:19-JUL-96			
L7305-126	D6-R34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-06B					
Water 1 S 6010 ICP METALS		Hold:18-DEC-96			
Water 1 S 6010 ICP TRACE		Hold:18-DEC-96			
Water 1 S 7470 MERCURY		Hold:19-JUL-96			
L7305-127	B8-D1	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-06B					
Water 1 S 6010 ICP METALS		Hold:18-DEC-96			
Water 1 S 6010 ICP TRACE		Hold:18-DEC-96			
Water 1 S 7470 MERCURY		Hold:19-JUL-96			
L7305-128	D7-34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-01B					
Water 1 S 6010 ICP METALS		Hold:18-DEC-96			
Water 1 S 6010 ICP TRACE		Hold:18-DEC-96			
Water 1 S 7470 MERCURY		Hold:19-JUL-96			

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LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 26 1996, 08:40 am

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-129	D7-15	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-01B					
Water 1 S 6010 ICP METALS		Hold:18-DEC-96			
Water 1 S 6010 ICP TRACE		Hold:18-DEC-96			
Water 1 S 7470 MERCURY		Hold:19-JUL-96			
L7305-130	I3-67	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-01B					
Water 1 S 6010 ICP METALS		Hold:18-DEC-96			
Water 1 S 6010 ICP TRACE		Hold:18-DEC-96			
Water 1 S 7470 MERCURY		Hold:19-JUL-96			
L7305-131	B4-61	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4; METALS=As,Cd,Cr,Pb,Ni,V					
Location: RFG01-01B					
Water 1 S 6010 ICP METALS		Hold:18-DEC-96			
Water 1 S 6010 ICP TRACE		Hold:18-DEC-96			
Water 1 S 7470 MERCURY		Hold:19-JUL-96			
L7305-132	C6-56	20-JUN-96	24-JUN-96		04-JUL-96
temp 9					
Location: RFG01-01B					
Water 1 S 353.2 NITRATE		Hold:18-JUL-96			
L7305-133	C6-58	20-JUN-96	24-JUN-96		04-JUL-96
temp 9					
Location: RFG01-01B					
Water 1 S 353.2 NITRATE		Hold:18-JUL-96			
L7305-134	A3-62	20-JUN-96	24-JUN-96		04-JUL-96
temp 9					
Location: RFG01-01B					
Water 1 S 353.2 NITRATE		Hold:18-JUL-96			
L7305-135	C6-R37	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: RFG01-01B					
Water 1 S 353.2 NITRATE		Hold:18-JUL-96			
L7305-136	C2-64	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: RFG01-01B					

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LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 26 1996, 08:40 am

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
Water 1 S 353.2 NITRATE		Hold:18-JUL-96			
L7305-137	C7-54	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: RFG01-01B					
Water 1 S 353.2 NITRATE		Hold:18-JUL-96			
L7305-138	D8-50	20-JUN-96	24-JUN-96		04-JUL-96
temp 12					
Location: RFG01-01B					
Water 1 S 353.2 NITRATE		Hold:18-JUL-96			
L7305-139	D8-48	20-JUN-96	24-JUN-96		04-JUL-96
temp 12					
Location: RFG01-01B					
Water 1 S 353.2 NITRATE		Hold:18-JUL-96			
L7305-140	D7-51	20-JUN-96	24-JUN-96		04-JUL-96
temp 12					
Location: RFG01-01B					
Water 1 S 353.2 NITRATE		Hold:18-JUL-96			
L7305-141	D7-33	20-JUN-96	24-JUN-96		04-JUL-96
temp 10					
Location: RFG01-01B					
Water 1 S 353.2 NITRATE		Hold:18-JUL-96			
L7305-142	C6-R04	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4 MS/MSD					
Location: RFG01-01B					
Water 1 S 353.2 NITRATE		Hold:19-JUL-96			
L7305-143	MS/MSD	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: RFG01-01B					
Water 1 S NONE		Hold:01-JUL-96			
L7305-144	C6-R36	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: RFG01-01B					
Water 1 S 353.2 NITRATE		Hold:19-JUL-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 26 1996, 08:40 am

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-145	D6-R34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: RFG01-01B					
Water 1 S 353.2 NITRATE		Hold:19-JUL-96			
L7305-146	B8-D1	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: RFG01-01B					
Water 1 S 353.2 NITRATE		Hold:19-JUL-96			
L7305-147	D7-34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: RFG01-01B					
Water 1 S 353.2 NITRATE		Hold:19-JUL-96			
L7305-148	D7-15	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: RFG01-01B					
Water 1 S 353.2 NITRATE		Hold:19-JUL-96			
L7305-149	I3-67	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: RFG01-01B					
Water 1 S 353.2 NITRATE		Hold:19-JUL-96			
L7305-150	B4-61	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: RFG01-01B					
Water 1 S 353.2 NITRATE		Hold:19-JUL-96			
L7305-151	C6-56	20-JUN-96	24-JUN-96		04-JUL-96
temp 9					
Location: RFG01-01B					
Water 1 S 160.1 TDS		Hold:27-JUN-96			
Water 1 S 310.1 ALKALINITY		Hold:04-JUL-96			
Water 1 S 325.2 CHLORIDE		Hold:18-JUL-96			
Water 1 S 375.4 SULFATE		Hold:18-JUL-96			
L7305-152	C6-58	20-JUN-96	24-JUN-96		04-JUL-96
temp 9					
Location: RFG01-01B					
Water 1 S 160.1 TDS		Hold:27-JUN-96			
Water 1 S 310.1 ALKALINITY		Hold:04-JUL-96			
Water 1 S 325.2 CHLORIDE		Hold:18-JUL-96			

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LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 26 1996, 08:40 am

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number			Client Sample Number	Collect Date	Receive Date	PR	Due Date
Water	1	S 375.4	SULFATE	Hold:18-JUL-96			
L7305-153			A3-62	20-JUN-96	24-JUN-96		04-JUL-96
temp 9							
Location:	RFG01-01B						
Water	1	S 160.1	TDS	Hold:27-JUN-96			
Water	1	S 310.1	ALKALINITY	Hold:04-JUL-96			
Water	1	S 325.2	CHLORIDE	Hold:18-JUL-96			
Water	1	S 375.4	SULFATE	Hold:18-JUL-96			
L7305-154			C6-R37	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4							
Location:	RFG01-01B						
Water	1	S 160.1	TDS	Hold:27-JUN-96			
Water	1	S 310.1	ALKALINITY	Hold:04-JUL-96			
Water	1	S 325.2	CHLORIDE	Hold:18-JUL-96			
Water	1	S 375.4	SULFATE	Hold:18-JUL-96			
L7305-155			C2-64	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4							
Location:	RFG01-01B						
Water	1	S 160.1	TDS	Hold:27-JUN-96			
Water	1	S 310.1	ALKALINITY	Hold:04-JUL-96			
Water	1	S 325.2	CHLORIDE	Hold:18-JUL-96			
Water	1	S 375.4	SULFATE	Hold:18-JUL-96			
L7305-156			C7-54	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4							
Location:	RFG01-01B						
Water	1	S 160.1	TDS	Hold:27-JUN-96			
Water	1	S 310.1	ALKALINITY	Hold:04-JUL-96			
Water	1	S 325.2	CHLORIDE	Hold:18-JUL-96			
Water	1	S 375.4	SULFATE	Hold:18-JUL-96			
L7305-157			D8-50	20-JUN-96	24-JUN-96		04-JUL-96
temp 12							
Location:	RFG01-01B						
Water	1	S 160.1	TDS	Hold:27-JUN-96			
Water	1	S 310.1	ALKALINITY	Hold:04-JUL-96			
Water	1	S 325.2	CHLORIDE	Hold:18-JUL-96			
Water	1	S 375.4	SULFATE	Hold:18-JUL-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 26 1996, 08:40 am

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-158	D8-48	20-JUN-96	24-JUN-96		04-JUL-96
temp 12					
Location: RFG01-01B					
Water 1 S 160.1 TDS		Hold:27-JUN-96			
Water 1 S 310.1 ALKALINITY		Hold:04-JUL-96			
Water 1 S 325.2 CHLORIDE		Hold:18-JUL-96			
Water 1 S 375.4 SULFATE		Hold:18-JUL-96			
L7305-159	D7-51	20-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: RFG01-01B					
Water 1 S 160.1 TDS		Hold:27-JUN-96			
Water 1 S 310.1 ALKALINITY		Hold:04-JUL-96			
Water 1 S 325.2 CHLORIDE		Hold:18-JUL-96			
Water 1 S 375.4 SULFATE		Hold:18-JUL-96			
L7305-160	D7-33	20-JUN-96	24-JUN-96		04-JUL-96
temp 10					
Location: RFG01-01A					
Water 1 S 160.1 TDS		Hold:27-JUN-96			
Water 1 S 310.1 ALKALINITY		Hold:04-JUL-96			
Water 1 S 325.2 CHLORIDE		Hold:18-JUL-96			
Water 1 S 375.4 SULFATE		Hold:18-JUL-96			
L7305-161	C6-R04	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4 MS/MSD					
Location: RFG01-01A					
Water 1 S 160.1 TDS		Hold:28-JUN-96			
Water 1 S 310.1 ALKALINITY		Hold:05-JUL-96			
Water 1 S 325.2 CHLORIDE		Hold:19-JUL-96			
Water 1 S 375.4 SULFATE		Hold:19-JUL-96			
L7305-162	MS/MSD	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: RFG01-01A					
Water 1 S NONE		Hold:01-JUL-96			
L7305-163	C6-R36	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: RFG01-01A					
Water 1 S 160.1 TDS		Hold:28-JUN-96			
Water 1 S 310.1 ALKALINITY		Hold:05-JUL-96			
Water 1 S 325.2 CHLORIDE		Hold:19-JUL-96			
Water 1 S 375.4 SULFATE		Hold:19-JUL-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 26 1996, 08:40 am

Login Number: L7305
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7305-164	D6-R34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: RFG01-01A					
Water 1 S 160.1 TDS		Hold:28-JUN-96			
Water 1 S 310.1 ALKALINITY		Hold:05-JUL-96			
Water 1 S 325.2 CHLORIDE		Hold:19-JUL-96			
Water 1 S 375.4 SULFATE		Hold:19-JUL-96			
L7305-165	B8-D1	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: RFG01-01A					
Water 1 S 160.1 TDS		Hold:28-JUN-96			
Water 1 S 310.1 ALKALINITY		Hold:05-JUL-96			
Water 1 S 325.2 CHLORIDE		Hold:19-JUL-96			
Water 1 S 375.4 SULFATE		Hold:19-JUL-96			
L7305-166	D7-34	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: RFG01-01A					
Water 1 S 160.1 TDS		Hold:28-JUN-96			
Water 1 S 310.1 ALKALINITY		Hold:05-JUL-96			
Water 1 S 325.2 CHLORIDE		Hold:19-JUL-96			
Water 1 S 375.4 SULFATE		Hold:19-JUL-96			
L7305-167	D7-15	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: RFG01-01A					
Water 1 S 160.1 TDS		Hold:28-JUN-96			
Water 1 S 310.1 ALKALINITY		Hold:05-JUL-96			
Water 1 S 325.2 CHLORIDE		Hold:19-JUL-96			
Water 1 S 375.4 SULFATE		Hold:19-JUL-96			
L7305-168	I3-67	21-JUN-96	24-JUN-96		04-JUL-96
temp 2to4					
Location: RFG01-01A					
Water 1 S 160.1 TDS		Hold:28-JUN-96			
Water 1 S 310.1 ALKALINITY		Hold:05-JUL-96			
Water 1 S 325.2 CHLORIDE		Hold:19-JUL-96			
Water 1 S 375.4 SULFATE		Hold:19-JUL-96			
L7305-169	REPORT TYPE	24-JUN-96	24-JUN-96		04-JUL-96
Location:					
Water 1 S EDD - DISK DEL.					
Water 1 S GCMS2					
Water 1 S INORG TYPE 2 RPT					

for Tony Miller
Signature: Mary B. Tank

Date: 6/26/96

L 1505

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CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manag

Sample Number	Depth	Time	Sample Type	Container Type	HVOCs 601/8010	BTE Only 602/8020	VOCs 624/8240	SVOCs 625/8270	TRPH 418.1	TPH 8015(M)-G	TPH 8015(M)-D	PCBs 8080	Total Pb/Cd 6010	PAHs ~~8100~~ 8310	TCLP	BTEX 8260	Metals	Intrinsic	Nitrate 353.2	FIELD NOTES:	Total Number Of Containers	Laboratory
C6-56		955	Water	40 ml VOA											X					w/HCl	3	
				1L glass amber										X							2	
				1L poly												X				w/HNO_3	1	
				1L poly													X				1	
				500ml poly														X		w/H_2SO_4	1	
C6-58		1100	Water	40 ml VOA											X					w/HCl	3	
				1L glass amber										X							2	
				1L poly												X				w/HNO_3	1	
				1L poly													X				1	
				500ml poly														X		w/H_2SO_4	1	
A3-62		1150	Water	40 ml VOA											X					w/HCl	3	
				1L glass amber										X							2	
				1L poly												X				w/HNO_3	1	
				1L poly													X				1	
				500ml poly														X		w/H_2SO_4	1	
C6-R31		1520	Water	40 ml ~~pp~~ VOA											X					w/HCl	3	
				1L glass amber										X							2	
				1L poly												X				w/HNO_3	1	

RELINQUISHED BY: (Signature) Zunji Sh DATE/TIME 6/20/96 1915, DHL 82/5289655 RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME 6.24.96 0800 RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES:

Metals: arsenic, cadmium, lead, mercury, nickel + vanadium

Intrinsic: alkalinity (310.2), sulfate (375.4), TDS (160.1), chloride (300/325.3)

ANALYTICAL LABORATORY Lockheed Analytical

LABORATORY CONTACT Mary Ford

D&M CONTACT Ed Tschupp PHONE (808) 593-1116 x 42

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1050 QUEEN STREET, SUITE 204
HONOLULU, HAWAII 96814
(808) 593-1116 FAX: (808) 593-1198

JOB NO.: 16000-5133-037 SHEET 1 OF 2

PROJECT Dissolved Phase Investigation

LOCATION Chevron Hawaii Refinery

COLLECTOR Zunji Sh DATE OF COLLECTION 6/20/96

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Man

Sample Number	Depth	Time	Sample Type	Container Type	HVOCs 601/8010	BTE Only 602/8020	VOCs ~~624/8240~~ 8260	SVOCs 625/8270	TRPH 418.1	TPH 8015(M)-G	TPH 8015(M)-D	PCBs 8080	Total Pb/Cd 6010	PAHs ~~8100~~ 8310	TCLP	BTEX 8260	Metals	Nitrate 353.2					FIELD NOTES:	Total Number Of Containers	Laboratory
C6-R37		1520	Water	1L poly													X							1	
↓		↓	↓	500ml poly														X					w/H_2SO_4	1	
C2-64		1640	Water	40 ml VOA		X								X									w/HCl	3	
				1L glass amber			X							X										3	
				1L poly												X							w/HNO_3	1	
				1L poly													X							1	
↓		↓	↓	500ml poly														X					w/H_2SO_4	1	

RELINQUISHED BY: (Signature) Zuyo Sh DATE/TIME 6/20/96 1915, RECEIVED BY: (Signature) DHL 8215289655

RELINQUISHED BY: (Signature) DATE/TIME 6.24.96/0900 RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES: See page 1

ANALYTICAL LABORATORY Lockheed Analytical

LABORATORY CONTACT Mary Ford

D&M CONTACT Ed Tschupp PHONE: (800) 593-1116 x32

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1050 QUEEN STREET, SUITE 204
HONOLULU, HAWAII 96814
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JOB NO.: 16000-533-037 SHEET 2 OF 2

PROJECT Dissolved Phase Investigation

LOCATION Chevron Hawaii Refinery

COLLECTOR Zuyo Sh DATE OF COLLECTION 6/20/96

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Mana

Sample Number	Depth	Time	Sample Type	Container Type	HVOCs 601/8010	BTE Only 602/8020	VOCs ~~8240~~ 8260	SVOCs 625/8270	TRPH 418.1	TPH 8015(M)-G	TPH 8015(M)-D	PCBs 8080	Total Pb/Cd 6010	PAHs ~~8100~~ 8310	TCLP	BTEX 8260	Metals	Intrinsic	Nitrate 353.2	FIELD NOTES:	Total Number Of Containers	Laboratory
C7-54			Water	40ml VOA			X													w/HCl	3	
↓		↓	↓	1L glass amber			X						X								3	
				1L poly												X				w/HNO3	1	
				1L poly													X				1	
↓		↓	↓	500ml poly														X		w/H2SO4	1	
D8-50		1200	Water	40ml VOA			X													w/HCl	3	
↓		↓	↓	1L glass amber			X						X								3	
				1L poly												X				w/HNO3	1	
				1L poly													X				1	
↓		↓	↓	500ml poly														X		w/H2SO4	1	
D8-48			Water	40ml VOA			X													w/HCl	3	
↓		↓	↓	1L glass amber			X						X								3	
				1L poly												X				w/HNO3	1	
				1L poly													X				1	
↓		↓	↓	500ml poly														X		w/H2SO4	1	
D7-51		1110	Water	40ml VOA											X					w/HCl	3	
↓		↓	↓	1L glass amber									X								2	
				1L poly												X				w/HNO3	1	

RELINQUISHED BY: (Signature) Alan Simpson DATE/TIME 6/20/96 1915 RECEIVED BY: (Signature) DHL 82/5259655

RELINQUISHED BY: (Signature) DATE/TIME 6-24-96/0900 RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES:

Metals: Arsenic, cadmium, lead, mercury, nickel, vanadi

Intrinsic: alkalinity (310.2), sulfate (375.4), TDS (160.1) + chloride (300/325.3)

ANALYTICAL LABORATORY Lockheed Analytical

LABORATORY CONTACT Mary Ford

D&M CONTACT Ed Tschupp PHONE (808) 593-1116 x32

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JOB NO 116000-533-037 SHEET 1 OF 2

PROJECT Dissolved Phase Investigation

LOCATION Chevron Hawaii Refinery

COLLECTOR Alan Simpson DATE OF COLLECTION 6/20/96

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Mana

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: HVOCs 601/8010	BTE Only 602/8020	VOCs 624/8240 8260	SVOCs 625/8270 8270	TRPH 418.1	TPH 8015(M)-G	TPH 8015(M)-D	PCBs 8080	Total Pb/Cd 6010	PAHs 8100 8310	TCLP	BTEX 8260	Metals	Nitrate 353.2						FIELD NOTES:	Total Number Of Containers	Laboratory
D7-51		1110	Water	1 L poly													X								1	
↓		↓	↓	500ml poly														X						w/ H_2SO_4	1	
D7-33		1535	Water	40ml VOA											X									w/ HCl	3	
				1L glass Amber										X											2	
				1L poly												X								w/ HNO_3	1	
				1L poly													X								1	
↓		↓	↓	500ml poly														X						w/ H_2SO_4	1	

RELINQUISHED BY: (Signature) Alan Simpson DATE/TIME 6/20/96 1915 RECEIVED BY: (Signature) DHL 82152896555

RELINQUISHED BY: (Signature) DATE/TIME 6-24-96/0815 RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY Lockheed Analytical

LABORATORY CONTACT Mary Ford

D&M CONTACT Ed Tschupp PHONE: (808) 593-1116 x32

DAMES & MOORE
1050 QUEEN STREET, SUITE 204
HONOLULU, HAWAII 96814
(808) 593-1116 FAX: (808) 593-1198

LABORATORY NOTES:

see page 1

JOB NO.: 16000-533-037 SHEET 2 OF 2

PROJECT Dissolved Phase Investigation

LOCATION Chevron Hawaii Refinery

COLLECTOR Alan Simpson DATE OF COLLECTION 6/20/96

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manag

Sample Number	Depth	Time	Sample Type	Container Type	HVOCs 601/8010	BTE Only 602/8020	VOCs 624/8240/8260	SVOCs 625/8270	TRPH 418.1	TPH 8015(M)-G	TPH 8015(M)-D	PCBs 8080	Total Pb/Cd 6010	PAHs 8100/8310	TCLP	BTEX 8260	Metals	Intrinsic	Nitrate 353.2	FIELD NOTES:	Total Number Of Containers	Laboratory Note Numbe
C6-R04		0915	Water	40 ml VOA			X													w/HCl	3	
↓		↓	↓	1L glass amber				X					X								3	
				1L poly												X				w/HNO3	1	
				1L poly													X				1	
↓		↓	↓	500ml poly														X		w/H2SO4	1	
MS/MSD		0915	Water	40 ml VOA			X													w/HCl	2	
↓		↓	↓	1Lglass amber				X					X								4	
				1L poly												X				w/HNO3	1	
				1L poly													X				1	
↓		↓	↓	500ml poly														X		w/H2SO4	1	
C6-R36		1135	Water	40 ml VOA											X					w/HCl	3	
↓		↓	↓	1L glass amber									X								2	
				1L poly												X				w/HNO3	1	
				1L poly													X				1	
↓		↓	↓	500ml poly														X		w/H2SO4	1	
D6-R34		1530	Water	40 ml VOA			X													w/HCl	3	
↓		↓	↓	1L glass amb				X					X								3	
				1L poly												X				w/HNO3	1	

RELINQUISHED BY: (Signature) Zyi Shen DATE/TIME 6/21/96 RECEIVED BY: (Signature) DHL 821528961

RELINQUISHED BY: (Signature) DATE/TIME 6-24-96/0845 RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY Lockheed Analytical

LABORATORY CONTACT Mary Ford

D&M CONTACT Ed Tschupp PHONE: (800) 593-1116 x42

DAMES & MOORE
1050 QUEEN STREET, SUITE 204
HONOLULU, HAWAII 96814
(808) 593-1116 FAX: (808) 593-1198

LABORATORY NOTES:

Metals: Arsenic, cadmium, lead, mercury, nickel + vanadi

Intrinsic: Alkalinity (310.2), sulfate (375.4), TDS (160.1
+ chloride (300/325.3).

JOB NO.: 16000-533-037 SHEET 1 OF 2

PROJECT Dissolved Phase Investigation

LOCATION Chevron Hawaii Refinery

COLLECTOR Z. Shen DATE OF COLLECTION 6/21/96

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manage

Sample Number	Depth	Time	Sample Type	Container Type	HVOCs 601/8010	BTE Only 602/8020	VOCs ~~8240/8260~~ 8260	SVOCs 625/8270	TRPH 418.1	TPH 8015(M)-G	TPH 8015(M)-D	PCBs 8080	Total Pb/Cd 6010	PAHs ~~8100~~ 8310	TCLP	BTEX 8260	Metals	Intrinsic	Nitrate 3532	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
D6-R34		1530	Water	1L poly												X					1	
↓		↓	↓	500ml poly													X			w/H_2SO_4	1	
B8-D1		1135	Water	40ml VOA										X						w/HCl	3	
				1Lglassamber									X								2	
				1L poly											X					w/HNO_3	1	
				1L poly												X					1	
↓		↓	↓	500ml poly													X			w/HCl	1	
TB5-002		1820	Trip	40ml VOA		X														w/HCl	3	

RELINQUISHED BY: (Signature) Cyn Se — DATE/TIME 6/21/96 — RECEIVED BY: (Signature) DHL 821 5289611

RELINQUISHED BY: (Signature) — DATE/TIME 6.24.96 0800 — RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) — DATE/TIME — RECEIVED BY: (Signature)

ANALYTICAL LABORATORY Lockheed Analytical

LABORATORY CONTACT Mary Ford

D&M CONTACT Ed Tschupp PHONE: Ext. 42

DAMES & MOORE
1050 QUEEN STREET, SUITE 204
HONOLULU, HAWAII 96814
(808) 593-1116 FAX: (808) 593-1198

LABORATORY NOTES:

See page 1

JOB NO. 16000-533-037 SHEET 2 OF 2

PROJECT Dissolved Phase Investigation

LOCATION Chevron Hawaii Refinery

COLLECTOR Z. Shen DATE OF COLLECTION 6/21/96

0017

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manag

Sample Number	Depth	Time	Sample Type	Container Type	HVOCs 601/8010	BTE Only 602/8020	VOCs ~~624/8240~~ 8260	SVOCs 625/8270	TRPH 418.1	TPH 8015(M)-G	TPH 8015(M)-D	PCBs 8080	Total Pb/Cd 6010	PAHs ~~8100~~ 8310	TCLP	BTEX 8260	Metals	Intrinsic	Nitrate 353.2	FIELD NOTES:	Total Number Of Containers	Laboratory
D7-34	-	1220	Water	40 ml VOA			X													w/HCl	3	
↓		↓	↓	1 L glass amber				X					X								3	
				1 L poly												X				w/HNO3	1	
				1 L poly													X				1	
				500 ml poly														X		w/H2SO4	1	
D7-15	-	1515	Water	40 ml VOA											X					w/HCl	3	
↓		↓	↓	1 L glass amber									X								2	
				1 L poly												X				w/HNO3	1	
				1 L poly													X				1	
				500 ml poly														X		w/H2SO4	1	
			Water	~~40 ml VOA~~																w/HCl		
				~~1 L glass amber~~																		
				1 L poly												X				w/HNO3		
				1 L poly													X					
				500 ml poly														X		w/H2SO4		

RELINQUISHED BY: (Signature) A. Simpson DATE/TIME 6/21/96 RECEIVED BY: (Signature) DHL 8215289611

RELINQUISHED BY: (Signature) DATE/TIME 6.24.96/0800 RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY Lockheed Analytical

LABORATORY CONTACT Mary Ford

D&M CONTACT Ed Tschupp PHONE (800) 593-1116 x 42

DAMES & MOORE
1050 QUEEN STREET, SUITE 204
HONOLULU, HAWAII 96814
(808) 593-1116 FAX: (808) 593-1198

LABORATORY NOTES:

Metals: Arsenic, cadmium, lead, mercury, nickel & vanadi

Intrinsic: Alkalinity (310.2), sulfate (375.4), TDS (160.1) & chloride (300/325.3)

JOB NO.: 16000-533-037 SHEET 1 OF 1

PROJECT Dissolved Phase Investigation

LOCATION Chevron Hawaii Refinery

COLLECTOR A. Simpson DATE OF COLLECTION 6/21/96

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

0019

CL0J4337

Sample Number	Depth	Time	Sample Type	Container Type	HVOCs 601/8010	BTE Only 602/8020	VOCs 624/8240 8260	SVOCs 625/8270	TRPH 418.1	TPH 8015(M)-G	TPH 8015(M)-D	PCBs 8080	Total Pb/Cd 6010	PAHs 8100 8310	TCLP	BTEX 8260	Metals	Intrinsic	Nitrate 353.2						FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
I3-67	-	1030	Water	40 ml VOA			X																		w/HCl	3	
				1 L glass amber				X					X													3	
				1L poly												X									w/HNO3	1	
				1L poly													X									1	
				500ml poly														X							w/H2SO4	1	
TBS-003		1815	Trip	40 ml VOA			X																			2	

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)
A. Simpson 6/21/96 1930 DHL Airbill 8215289811

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)
6-24-96/0900 A. Simpson

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY Lockheed Analytical

LABORATORY CONTACT Mary Ford

PROJECT CONTACT Ed Tschupp PHONE: Ext. 42

LABORATORY NOTES:

Metals: Arsenic, Cadmium, Lead, Mercury, Nickel + Vanadium

Intrinsic: Alkalinity (310.2), sulfate (375.4), TDS (160.1), + chloride (300/325.3)

JOB NO.: 16000-533-037 SHEET 1 OF 1

PROJECT Dissolved Phase Investigation

LOCATION Chevron Hawaii Refinery

COLLECTOR A. Simpson DATE OF COLLECTION 6/21/96

DAMES & MOORE
1050 QUEEN STREET, SUITE 204
HONOLULU, HAWAII 96814
(808) 593-1116 FAX: (808) 593-1198

DAMES & MOORE
1050 QUEEN STREET, SUITE 204, HONOLULU, HAWAII 96814
(808) 593-1116 FAX: (808) 593-1198

FACSIMILE HEADER

TO: Lockheed Analytical
DATE: 6/25/96
ATTENTION: Mary Ford
FAX NO.: (702) 361-3137
FROM: Carol Mitsuyasu X32
D & M PROJECT NO.: 16000-533-037
No. of Pages (including Header): 3
(Operator: _____)

If you do not receive all pages, or if transmission is unsatisfactory, please inform us immediately.

Phone: (808) 593-1116 Fax: (808) 593-1198

MESSAGE:

Mary -

Here are some corrected COC pages for the samples shipped last week.

Please call if you have any questions.

Thanks!
Carol

★ Revisions to COC, 6/24/96 ZS

0020

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Sample Number	Depth	Time	Sample Type	Container Type	HVOCs 601/8010	BTE Only 602/8020	VOCs 624/8240	SVOCs 625/8270	STPH 418.1	ATPH 8015(M)-G	TPH 8015(M)-D	PCBs 8080	Total Pb/Cd 6010	PAHs 8310	TCLP	BTEX 8020	Methanol	Nitrate	Nitrate	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
6-R34		1530	Water	1L poly												X		X			1	
↓		↓	↓	500ml poly													X			W/H_2SO_4	1	
38-D1		1135	Water	40ml VOA											X					W/HCl	3	
↓		↓	↓	1L glass amber									X								2	
				1L poly												X				W/HNO_3	1	
				1L poly													X				1	
↓		↓	↓	500ml poly														X		W/HCl H_2SO_4	1	
BS-002		1820	Trip	40ml VOA		X														W/HCl	3	
34-61		1750	Water	40ml VOA											X					W/HCl	3	
↓		↓	↓	1L glass amber									X								2	
				1L poly												X				W/HNO_3	1	
				1L poly													X				1	
↓		↓	↓	500ml poly														X		W/H_2SO_4	1	

RELINQUISHED BY: (Signature) DATE/TIME 6/21/96 RECEIVED BY: (Signature) DHL 821 5289611

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY: Lockheed Analytical

LABORATORY CONTACT: Mary Ford

CONTACT: Ed Tschupp PHONE: Ext. 42

DAMES & MOORE
1050 QUEEN STREET, SUITE 204
HONOLULU, HAWAII 96814
(808) 593-1116 FAX: (808) 593-1198

LABORATORY NOTES:

See page 1

★ Sample in cooler not on original COC. ZS

JOB NO.: 16000-533-057 SHEET 2 OF 2

PROJECT Dissolved Phase Investigation

LOCATION Chevron Hawaii Refinery

COLLECTOR Z. Shen DATE OF COLLECTION 6/21/96

★ Revisions to COC, 6/24/96 014

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Sample Number	Depth	Time	Sample Type	Container Type	HVOCs 601/8010	BTE Only 602/8020	VOCs 624/8240	SVOCs 625/8270	TRPH 418.1	TPH 8015(M)-G	TPH 8015(M)-D	PCBs 8080	Total Pb/Cd 6010	PAHs 8100	TCLP	BTEX 8020	Benzene 8020	TPH-G 8015	TPH-D 8015	Chromium 6010	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
D7-51		1110	Water	1L poly														X				1	
↓		↓	↓	500ml poly															X		w/ H_2SO_4	1	
D7-33		1535	Water	40ml VOA											X						w/ HCl	3	
↓		↓	↓	1L glass Amber								X										2	
				1L poly													X				w/ HNO_3	1	
				1L poly														X				1	
↓		↓	↓	500ml poly															X		w/ H_2SO_4	1	
BS-001			Trip	40ml VOA		X															w/ HCl	3	

RELINQUISHED BY: (Signature) Alan Simpson DATE/TIME 6/20/96 1915 RECEIVED BY: (Signature) DHL 821589655

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY: Lockheed Analytical

LABORATORY CONTACT: Mary Ford

PROJECT CONTACT: Ed Tschupp (808) 593-1116 x32 PHONE:

DAMES & MOORE
1050 QUEEN STREET, SUITE 204
HONOLULU, HAWAII 96814
(808) 593-1116 FAX: (808) 593-1198

LABORATORY NOTES:

see page 1

★ Sample in cooler not on original COC.

JOB NO.: 11,000-533-037 SHEET 2 OF 2

PROJECT Dissolved Phase Investigation

LOCATION Chevron Hawaii Refinery

COLLECTOR Alan Simpson DATE OF COLLECTION 6/20/96

0C094337

LOCKHEED MARTIN

Sample Login
Login Review Checklist

Lot Number L7305

The login review should be conducted by that person logging in the samples as well as a peer. Please use this checklist to ensure that such reviews occur in a uniform basis. Please sign and date below to verify that a login review has occurred. This checklist should be affixed to each login package prior to distribution.

For effective login review, at a minimum, five reports form the login process are required. These are the COC (or equivalent), the login COC report, the sample summary report, the sample receiving checklist, and the login quotation. Before beginning review, ensure that these five components are available. Jobs with single component samples, the sample summary report may be omitted.

SAMPLE SUMMARY REPORT	YES	NO	N/A	Comment
1. Are all sample ID's correct?	X			
2. Are all samples present?	X			
3. Are all matrices indicated correctly?	X			
4. Are all analyses on the COC logged in for the appropriate samples?	X			
5. Are all analyses logged in for the correct container?	X			
6. Are samples logged in according to LAS batching procedures?	X			

LOGIN CHAIN OF CUSTODY	YES	NO	N/A	Comment
1. Are the collect, receive, and due dates correct for every sample?	X			
2. Have all appropriate comments been indicated in the comment section?			X	

SAMPLE RECEIVING CHECKLIST	YES	NO	N/A	Comment
1. Are all discrepancies between the COC and the login noted (if applicable)?	X			

also reviewed by MBF 6/26/96 -

[signature] 6-25-96 [signature] 6-25-96

ockheed Analytical Services
ample Rec ing Checklist

Page of

Client Name: Dames & Moore Job No. 73055 Cooler ID:

OOLER CONDITION UPON RECEIPT			
mperature of cooler upon receipt:	2°C		
nperature of temp. blank upon receipt:			
	Yes	**No**	*** Comments/Discrepancies**
tody seals intact	X		
in of custody present	X		
e ice (or equiv.) present/frozen	X		
survey completed	X		
MPLE CONDITION UPON RECEIPT			
	Yes	**No**	*** Comments/Discrepancies**
bottles labeled	X		
nples intact	X		
per container used for sample type	X		
nple volume sufficient for analysis	X		
per pres. indicated on the COC	X		
A's contain headspace	X		CL-836 contains headspace in 2 vials
samples bi-phasic (if so, indicate sample ID'S):			N/A
SCELLANEOUS ITEMS			
	Yes	**No**	*** Comments/Discrepancies**
nples with short holding times		X	
nples to subcontract		X	
DDITIONAL COMMENTS/DISCREPANCIES			

mpleted by / date: 6-25-96

t to the client (date/initials): OK MBF 6/26/96 ** Client's signature upon receipt:

*es: * = contact the appropriate CSR of any discrepancies immediately upon receipt*

= please review this information and return via facsimille to the appropriate CSR (702) 361-8146

rsion 2.0 (11/11/94)

CL-4337

ockheed Analytical Services
ample Rec ing Checklist

Page of

OG43337

ent Name: Dames & Moore Job No. L7355 Cooler ID: 68131

OLER CONDITION UPON RECEIPT			
nperature of cooler upon receipt:	3°C		
perature of temp. blank upon receipt:			
	Yes	No	* Comments/Discrepancies
ody seals intact	X		
in of custody present	X		
ice (or equiv.) present/frozen	X		
survey completed	X		

MPLE CONDITION UPON RECEIPT			
	Yes	No	* Comments/Discrepancies
ottles labeled	X		
ples intact	X		
per container used for sample type	X		
ple volume sufficient for analysis	X		
per pres. indicated on the COC	X		
A's contain headspace	X		SD # w/ Headspace: MS, MSD = 2 vials
samples bi-phasic (if so, indicate sample ID'S):			MW 06-R04 = 2 vials

SCELLANEOUS ITEMS			
	Yes	No	* Comments/Discrepancies
ples with short holding times		X	
ples to subcontract		X	

DITIONAL COMMENTS/DISCREPANCIES

mpleted by / date: 6-25-96

t to the client (date/initials): OK MSF 6/26/96 ** Client's signature upon receipt:

es: * = contact the appropriate CSR of any discrepancies immediately upon receipt

= please review this information and return via facsimile to the appropriate CSR (702) 361-8146

rsion 2.0 (11/11/94)

CW 24337

ockheed Analytical Services
ample Rec ing Checklist

ent Name: Dames & Moore Job No. 47705 Cooler ID: 68129

OLER CONDITION UPON RECEIPT

nperature of cooler upon receipt:	2°C
nperature of temp. blank upon receipt:	

	Yes	No	* Comments/Discrepancies
tody seals intact	X		
in of custody present	X		
ice (or equiv.) present/frozen	X		
survey completed	X		

MPLE CONDITION UPON RECEIPT

	Yes	No	* Comments/Discrepancies
bottles labeled	X		
nples intact		X	ID # 07-15 in a 1 liter amber container for 8310 was received broken
per container used for sample type	X		
nple volume sufficient for analysis	X		
per pres. indicated on the COC	X		
A's contain headspace	X		TBS-003 = 3 vials contained headspace
samples bi-phasic (if so, indicate sample ID'S):			NA

SCELLANEOUS ITEMS

	Yes	No	* Comments/Discrepancies
nples with short holding times		X	
nples to subcontract		X	

DDITIONAL COMMENTS/DISCREPANCIES

mpleted by / date: [signature] 6-25-96

nt to the client (date/initials): CK MSF 6/26/96 ** Client's signature upon receipt:

*tes: * = contact the appropriate CSR of any discrepancies immediately upon receipt*

= please review this information and return via facsimile to the appropriate CSR (702) 361-8146

ockheed Analytical Services
ample Re ing Checklist

Page of

Oct 4337

ient Name: Dames & Moore Job No. 47705 Cooler ID: 68107

OOLER CONDITION UPON RECEIPT			
mperature of cooler upon receipt:	4°C		
perature of temp. blank upon receipt:			
	Yes	**No**	*** Comments/Discrepancies**
tody seals intact	X		
in of custody present	X		
e ice (or equiv.) present/frozen	X		
survey completed	X		
MPLE CONDITION UPON RECEIPT			
	Yes	**No**	*** Comments/Discrepancies**
bottles labeled	X		
ples intact	X		
per container used for sample type	X		
ple volume sufficient for analysis	X		
per pres. indicated on the COC	X		
A's contain headspace			N/A
samples bi-phasic (if so, indicate sample ID'S):			N/A
SCELLANEOUS ITEMS			
	Yes	**No**	*** Comments/Discrepancies**
ples with short holding times		X	
ples to subcontract		X	
DITIONAL COMMENTS/DISCREPANCIES			

mpleted by / date: 6-25-96

t to the client (date/initials): MSF 6/26/96 ** Client's signature upon receipt:

es: * = contact the appropriate CSR of any discrepancies immediately upon receipt

= please review this information and return via facsimile to the appropriate CSR (702) 361-8146

rsion 2.0 (11/11/94)

ockheed Analytical Services
ample Rec ing Checklist

Page of

OC4337

lent Name: Dames & Moore Job No. 47305 Cooler ID:

OLER CONDITION UPON RECEIPT			
mperature of cooler upon receipt:	2 °C		
nperature of temp. blank upon receipt:			
	Yes	No	* Comments/Discrepancies
tody seals intact	X		
ain of custody present	X		
e ice (or equiv.) present/frozen	X		
survey completed	X		

MPLE CONDITION UPON RECEIPT			
	Yes	No	* Comments/Discrepancies
bottles labeled	X		
nples intact		X	ID # B4-61 in a 1 liter poly container for intrinsic parameters was received with the lid off and sample was lost
per container used for sample type	X		
nple volume sufficient for analysis	X		
per pres. indicated on the COC	X		
A's contain headspace			NA
samples bi-phasic (if so, indicate sample ID'S):			NA

SCELLANEOUS ITEMS			
	Yes	No	* Comments/Discrepancies
nples with short holding times		X	
nples to subcontract		X	

DITIONAL COMMENTS/DISCREPANCIES

B4-61 was received but not on COC. Logged into data base per container information. COC was faxed 6/25/96 by the client - No intrinsic container was received - 6/26/96 MKF

mpleted by / date: [signature] 6-25-96

t to the client (date/initials): MKF 6/26/96 ** Client's signature upon receipt:

e: * = contact the appropriate CSR of any discrepancies immediately upon receipt

= please review this information and return via facsimile to the appropriate CSR (702) 361-8146

rsion 2.0 (11/11/94)

ckheed Analytical Services
ample Rec ng Checklist

OCO4337

nt Name: Dames & Moore Job No. L7305 Cooler ID:

OLER CONDITION UPON RECEIPT			
perature of cooler upon receipt:	4°C		
perature of temp. blank upon receipt:			
	Yes	No	* Comments/Discrepancies
ody seals intact	X		
n of custody present	X		
ice (or equiv.) present/frozen	X		
survey completed	X		

MPLE CONDITION UPON RECEIPT			
	Yes	No	* Comments/Discrepancies
ottles labeled	X		
oles intact	X		
er container used for sample type	X		
ole volume sufficient for analysis	X		
er pres. indicated on the COC	X		
A's contain headspace			NA
amples bi-phasic (if so, indicate sample ID'S):			NA

CELLANEOUS ITEMS			
	Yes	No	* Comments/Discrepancies
oles with short holding times		X	
oles to subcontract		X	

DITIONAL COMMENTS/DISCREPANCIES

pleted by / date: [signature] 6-25-96

to the client (date/initials): OK MBK 6/26/96 ** Client's signature upon receipt:

*: * = contact the appropriate CSR of any discrepancies immediately upon receipt*

please review this information and return via facsimile to the appropriate CSR (702) 361-8146

sion 2.0 (11/11/94)

ockheed Analytical Services
ample Re ing Checklist

Page of

C0024337

lent Name: Dames & Moore Job No. 47305 Cooler ID: 6832

OOLER CONDITION UPON RECEIPT

mperature of cooler upon receipt:	9°C	notified May Good 6-24-96	
perature of temp. blank upon receipt:			
	Yes	No	* Comments/Discrepancies
tody seals intact	X		
in of custody present	X		
e ice (or equiv.) present/frozen		X	ice not frozen
survey completed	X		

MPLE CONDITION UPON RECEIPT

	Yes	No	* Comments/Discrepancies
bottles labeled	X		
ples intact	X		
per container used for sample type	X		
ple volume sufficient for analysis	X		
per pres. indicated on the COC	X		
A's contain headspace	X		5D # w/Headspace: TBS001 : 2 vials
samples bi-phasic (if so, indicate sample ID'S):			NA

SCELLANEOUS ITEMS

	Yes	No	* Comments/Discrepancies
ples with short holding times		X	
ples to subcontract		X	

DITIONAL COMMENTS/DISCREPANCIES

TBS-001 was received but not listed on COC for Volatiles. Logged into data base for VOA's -

npleted by / date: [signature] 6-25-96

t to the client (date/initials): CA MBF 6/26/96 ** Client's signature upon receipt:

e: * = contact the appropriate CSR of any discrepancies immediately upon receipt

please review this information and return via facsimile to the appropriate CSR (702) 361-8146

sion 2.0 (11/11/94)

ockheed Analytical Services
ample Rec ing Checklist

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OG4337

lent Name: Dames & Moore Job No. L7305 Cooler ID:

OOLER CONDITION UPON RECEIPT			
mperature of cooler upon receipt:	10°C		not Food Mgy Food 6-24-96
nperature of temp. blank upon receipt:			
	Yes	**No**	*** Comments/Discrepancies**
stody seals intact	X		
ain of custody present	X		
e ice (or equiv.) present/frozen		X	ice not frozen
l survey completed	X		
LMPLE CONDITION UPON RECEIPT			
	Yes	**No**	*** Comments/Discrepancies**
bottles labeled	X		
nples intact	X		
per container used for sample type	X		
nple volume sufficient for analysis	X		
per pres. indicated on the COC	X		
A's contain headspace			
samples bi-phasic (if so, indicate sample ID'S):			
SCELLANEOUS ITEMS			
	Yes	**No**	*** Comments/Discrepancies**
nples with short holding times		X	
nples to subcontract		X	
DITIONAL COMMENTS/DISCREPANCIES			
npleted by / date:			6-25-96
t to the client (date/initials):	OK MSF 6/26/96		** Client's signature upon receipt:

**: * = contact the appropriate CSR of any discrepancies immediately upon receipt*

** please review this information and return via facsimille to the appropriate CSR (702) 361-8146*

rsion 2.0 (11/11/94)

Lockheed Analytical Services
Sample Rec ing Checklist

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C1624337

Client Name: Dames & Moore Job No. 47205 Cooler ID: 68109

COOLER CONDITION UPON RECEIPT			
Temperature of cooler upon receipt:	12°C		not noted Mary Ford on 6-24-96
mperature of temp. blank upon receipt:			
	Yes	No	* Comments/Discrepancies
stody seals intact	X		
ain of custody present	X		
ue ice (or equiv.) present/frozen		X	ice not frozen
d survey completed	X		
AMPLE CONDITION UPON RECEIPT			
	Yes	No	* Comments/Discrepancies
bottles labeled	X		
mples intact	X		
oper container used for sample type	X		
mple volume sufficient for analysis	X		
oper pres. indicated on the COC	X		
OA's contain headspace			NA
e samples bi-phasic (if so, indicate sample ID'S):			NA
ISCELLANEOUS ITEMS			
	Yes	No	* Comments/Discrepancies
nples with short holding times		X	
nples to subcontract		X	
DDITIONAL COMMENTS/DISCREPANCIES			
mpleted by / date:	[illegible] 6/25/96		
t to the client (date/initials):	CK MBF 6/26/96		** Client's signature upon receipt:

*ce: * = contact the appropriate CSR of any discrepancies immediately upon receipt*

= please review this information and return via facsimille to the appropriate CSR (702) 361-8146

rsion 2.0 (11/11/94)

C6043

...orized Analytical Services
...mple Rec...ing Checklist

...nt Name: Dames & Moore Job No. L7305 Cooler ID: 6897

...OLER CONDITION UPON RECEIPT			
...perature of cooler upon receipt:	3°C		
...perature of temp. blank upon receipt:			
	Yes	**No**	*** Comments/Discrepancies**
...tody seals intact	X		
...in of custody present	X		
...ice (or equiv.) present/frozen	X		
...survey completed	X		
...MPLE CONDITION UPON RECEIPT			
	Yes	**No**	*** Comments/Discrepancies**
...ottles labeled	X		
...ples intact	X		
...er container used for sample type	X		
...ple volume sufficient for analysis	X		
...er pres. indicated on the COC	X		
...A's contain headspace			MH
...samples bi-phasic (if so, indicate sample ID'S):			MH
...ICELLANEOUS ITEMS			
	Yes	**No**	*** Comments/Discrepancies**
...ples with short holding times		X	
...ples to subcontract		X	

...DITIONAL COMMENTS/DISCREPANCIES

...pleted by / date: ALM 6-25-96

...to the client (date/initials): OK MSF 6/26/96 ** Client's signature upon receipt:

... = contact the appropriate CSR of any discrepancies immediately upon receipt*

...please review this information and return via facsimile to the appropriate CSR (702) 361-8146

...sion 2.0 (11/11/94)

Lockheed Analytical Laboratory
SAMPLE SUMMARY REPORT (su02)
Dames & Moore * Sacramento, CA

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method
A3-62	L7305-7		Water	8260 VOLATILES
	L7305-70		Water	8270 SIM
	L7305-115		Water	6010 ICP METALS
	L7305-115		Water	6010 ICP TRACE
	L7305-115		Water	7470 MERCURY
	L7305-134		Water	353.2 NITRATE
	L7305-153		Water	160.1 TDS
	L7305-153		Water	310.1 ALKALINITY
	L7305-153		Water	325.2 CHLORIDE
	L7305-153		Water	375.4 SULFATE
B4-61	L7305-63		Water	8260 VOLATILES
	L7305-101		Water	8270 SIM
	L7305-131		Water	6010 ICP METALS
	L7305-131		Water	6010 ICP TRACE
	L7305-131		Water	7470 MERCURY
	L7305-150		Water	353.2 NITRATE
B8-D1	L7305-42		Water	8260 VOLATILES
	L7305-94		Water	8270 SIM
	L7305-127		Water	6010 ICP METALS
	L7305-127		Water	6010 ICP TRACE
	L7305-127		Water	7470 MERCURY
	L7305-146		Water	353.2 NITRATE
	L7305-165		Water	160.1 TDS
	L7305-165		Water	310.1 ALKALINITY
	L7305-165		Water	325.2 CHLORIDE
	L7305-165		Water	375.4 SULFATE
C2-64	L7305-13		Water	8260 VOLATILES
	L7305-74		Water	8270 SIM
	L7305-103		Water	8270 SEMI-VOLATI
	L7305-117		Water	6010 ICP METALS
	L7305-117		Water	6010 ICP TRACE
	L7305-117		Water	7470 MERCURY
	L7305-136		Water	353.2 NITRATE
	L7305-155		Water	160.1 TDS
	L7305-155		Water	310.1 ALKALINITY
	L7305-155		Water	325.2 CHLORIDE
	L7305-155		Water	375.4 SULFATE
C6-56	L7305-1		Water	8260 VOLATILES
	L7305-66		Water	8270 SIM
	L7305-113		Water	6010 ICP METALS
	L7305-113		Water	6010 ICP TRACE
	L7305-113		Water	7470 MERCURY
	L7305-132		Water	353.2 NITRATE
	L7305-151		Water	160.1 TDS
	L7305-151		Water	310.1 ALKALINITY
	L7305-151		Water	325.2 CHLORIDE
	L7305-151		Water	375.4 SULFATE
C6-58	L7305-4		Water	8260 VOLATILES
	L7305-68		Water	8270 SIM

Lockheed Analytical Laboratory
SAMPLE SUMMARY REPORT (su02)
Dames & Moore * Sacramento, CA

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method
	L7305-114		Water	6010 ICP METALS
	L7305-114		Water	6010 ICP TRACE
	L7305-114		Water	7470 MERCURY
	L7305-133		Water	353.2 NITRATE
	L7305-152		Water	160.1 TDS
	L7305-152		Water	310.1 ALKALINITY
	L7305-152		Water	325.2 CHLORIDE
	L7305-152		Water	375.4 SULFATE
C6-R04	L7305-31		Water	8260 VOLATILES
	L7305-86		Water	8270 SIM
	L7305-107		Water	8270 SEMI-VOLATIL
	L7305-123		Water	6010 ICP METALS
	L7305-123		Water	6010 ICP TRACE
	L7305-123		Water	7470 MERCURY
	L7305-142		Water	353.2 NITRATE
	L7305-161		Water	160.1 TDS
	L7305-161		Water	310.1 ALKALINITY
	L7305-161		Water	325.2 CHLORIDE
	L7305-161		Water	375.4 SULFATE
C6-R36	L7305-36		Water	8260 VOLATILES
	L7305-90		Water	8270 SIM
	L7305-125		Water	6010 ICP METALS
	L7305-125		Water	6010 ICP TRACE
	L7305-125		Water	7470 MERCURY
	L7305-144		Water	353.2 NITRATE
	L7305-163		Water	160.1 TDS
	L7305-163		Water	310.1 ALKALINITY
	L7305-163		Water	325.2 CHLORIDE
	L7305-163		Water	375.4 SULFATE
C6-R37	L7305-10		Water	8260 VOLATILES
	L7305-72		Water	8270 SIM
	L7305-116		Water	6010 ICP METALS
	L7305-116		Water	6010 ICP TRACE
	L7305-116		Water	7470 MERCURY
	L7305-135		Water	353.2 NITRATE
	L7305-154		Water	160.1 TDS
	L7305-154		Water	310.1 ALKALINITY
	L7305-154		Water	325.2 CHLORIDE
	L7305-154		Water	375.4 SULFATE
C7-54	L7305-16		Water	8260 VOLATILES
	L7305-76		Water	8270 SIM
	L7305-104		Water	8270 SEMI-VOLATI
	L7305-118		Water	6010 ICP METALS
	L7305-118		Water	6010 ICP TRACE
	L7305-118		Water	7470 MERCURY
	L7305-137		Water	353.2 NITRATE
	L7305-156		Water	160.1 TDS
	L7305-156		Water	310.1 ALKALINITY
	L7305-156		Water	325.2 CHLORIDE
	L7305-156		Water	375.4 SULFATE
D6-R34	L7305-39		Water	8260 VOLATILES

Lockheed Analytical Laboratory
SAMPLE SUMMARY REPORT (su02)
Dames & Moore * Sacramento, CA

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method
	L7305-92		Water	8270 SIM
	L7305-110		Water	8270 SEMI-VOLATIL
	L7305-126		Water	6010 ICP METALS
	L7305-126		Water	6010 ICP TRACE
	L7305-126		Water	7470 MERCURY
	L7305-145		Water	353.2 NITRATE
	L7305-164		Water	160.1 TDS
	L7305-164		Water	310.1 ALKALINITY
	L7305-164		Water	325.2 CHLORIDE
	L7305-164		Water	375.4 SULFATE
D7-15	L7305-51		Water	8260 VOLATILES
	L7305-98		Water	8270 SIM
	L7305-129		Water	6010 ICP METALS
	L7305-129		Water	6010 ICP TRACE
	L7305-129		Water	7470 MERCURY
	L7305-148		Water	353.2 NITRATE
	L7305-167		Water	160.1 TDS
	L7305-167		Water	310.1 ALKALINITY
	L7305-167		Water	325.2 CHLORIDE
	L7305-167		Water	375.4 SULFATE
D7-33	L7305-28		Water	8260 VOLATILES
	L7305-84		Water	8270 SIM
	L7305-122		Water	6010 ICP METALS
	L7305-122		Water	6010 ICP TRACE
	L7305-122		Water	7470 MERCURY
	L7305-141		Water	353.2 NITRATE
	L7305-160		Water	160.1 TDS
	L7305-160		Water	310.1 ALKALINITY
	L7305-160		Water	325.2 CHLORIDE
	L7305-160		Water	375.4 SULFATE
D7-34	L7305-48		Water	8260 VOLATILES
	L7305-96		Water	8270 SIM
	L7305-111		Water	8270 SEMI-VOLATIL
	L7305-128		Water	6010 ICP METALS
	L7305-128		Water	6010 ICP TRACE
	L7305-128		Water	7470 MERCURY
	L7305-147		Water	353.2 NITRATE
	L7305-166		Water	160.1 TDS
	L7305-166		Water	310.1 ALKALINITY
	L7305-166		Water	325.2 CHLORIDE
	L7305-166		Water	375.4 SULFATE
D7-51	L7305-25		Water	8260 VOLATILES
	L7305-82		Water	8270 SIM
	L7305-121		Water	6010 ICP METALS
	L7305-121		Water	6010 ICP TRACE
	L7305-121		Water	7470 MERCURY
	L7305-140		Water	353.2 NITRATE
	L7305-159		Water	160.1 TDS
	L7305-159		Water	310.1 ALKALINITY
	L7305-159		Water	325.2 CHLORIDE
	L7305-159		Water	375.4 SULFATE

Lockheed Analytical Laboratory
SAMPLE SUMMARY REPORT (su02)
Dames & Moore * Sacramento, CA

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method
D8-48	L7305-22		Water	8260 VOLATILES
	L7305-80		Water	8270 SIM
	L7305-106		Water	8270 SEMI-VOLATIL
	L7305-120		Water	6010 ICP METALS
	L7305-120		Water	6010 ICP TRACE
	L7305-120		Water	7470 MERCURY
	L7305-139		Water	353.2 NITRATE
	L7305-158		Water	160.1 TDS
	L7305-158		Water	310.1 ALKALINITY
	L7305-158		Water	325.2 CHLORIDE
	L7305-158		Water	375.4 SULFATE
D8-50	L7305-19		Water	8260 VOLATILES
	L7305-78		Water	8270 SIM
	L7305-105		Water	8270 SEMI-VOLATIL
	L7305-119		Water	6010 ICP METALS
	L7305-119		Water	6010 ICP TRACE
	L7305-119		Water	7470 MERCURY
	L7305-138		Water	353.2 NITRATE
	L7305-157		Water	160.1 TDS
	L7305-157		Water	310.1 ALKALINITY
	L7305-157		Water	325.2 CHLORIDE
	L7305-157		Water	375.4 SULFATE
I3-67	L7305-54		Water	8260 VOLATILES
	L7305-99		Water	8270 SIM
	L7305-112		Water	8270 SEMI-VOLATIL
	L7305-130		Water	6010 ICP METALS
	L7305-130		Water	6010 ICP TRACE
	L7305-130		Water	7470 MERCURY
	L7305-149		Water	353.2 NITRATE
	L7305-168		Water	160.1 TDS
	L7305-168		Water	310.1 ALKALINITY
	L7305-168		Water	325.2 CHLORIDE
	L7305-168		Water	375.4 SULFATE
MS/MSD	L7305-34		Water	NONE
	L7305-35		Water	NONE
	L7305-88		Water	NONE
	L7305-89		Water	NONE
	L7305-108		Water	NONE
	L7305-109		Water	NONE
	L7305-124		Water	NONE
	L7305-143		Water	NONE
	L7305-162		Water	NONE
REPORT TYPE	L7305-169		Water	EDD - DISK DEL
	L7305-169		Water	GCMS2
	L7305-169		Water	INORG TYPE 2 RPT
TBS-001	L7305-60		Water	8260 VOLATILES
TBS-002	L7305-45		Water	8260 VOLATILES
TBS-003	L7305-57		Water	8260 VOLATILES

NON-METALS

WATER

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: I3-67	Date Collected: 21-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	2100	20.		26-JUN-96	38440	L7305-168
Alkalinity, total (as CaCO3)	mg/L	310.1	360	10.		28-JUN-96	38432	L7305-168
Chloride	mg/L	325.2	870	100	D(1:100)	01-JUL-96	38433	L7305-168
Nitrate-Nitrite-Nitrogen	mg/L	353.2	0.65	0.050		26-JUN-96	38434	L7305-149
SULFATE	mg/L	375.4	100	25.	D(1:5)	03-JUL-96	38436	L7305-168

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: B4-61	Date Collected: 21-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	3100	20.		28-JUN-96	38507	L7305-102
Alkalinity, total (as CaCO3)	mg/L	310.1	1100	10.		02-JUL-96	38506	L7305-102
Chloride	mg/L	325.2	1300	100	D(1:100)	01-JUL-96	38504	L7305-102
Nitrate-Nitrite-Nitrogen	mg/L	353.2	0.020	0.050	B	26-JUN-96	38434	L7305-150
SULFATE	mg/L	375.4	180	50.	D(1:10)	03-JUL-96	38505	L7305-102

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: C6-56	Date Collected: 20-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	11000	20.		26-JUN-96	38440	L7305-151
Alkalinity, total (as CaCO3)	mg/L	310.1	460	10.		28-JUN-96	38432	L7305-151
Chloride	mg/L	325.2	6700	100	D(1:100)	02-JUL-96	38433	L7305-151
Nitrate-Nitrite-Nitrogen	mg/L	353.2	0.21	0.050		26-JUN-96	38434	L7305-132
SULFATE	mg/L	375.4	810	250	D(1:50)	03-JUL-96	38436	L7305-151

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: C6-58	Date Collected: 20-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	9000	20.		26-JUN-96	38440	L7305-152
Alkalinity, total (as CaCO3)	mg/L	310.1	400	10.		28-JUN-96	38432	L7305-152
Chloride	mg/L	325.2	5700	100	D(1:100)	02-JUL-96	38433	L7305-152
Nitrate-Nitrite-Nitrogen	mg/L	353.2	< 0.020	0.050	U	26-JUN-96	38434	L7305-133
SULFATE	mg/L	375.4	470	100	D(1:20)	03-JUL-96	38436	L7305-152

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: A3-62	Date Collected: 20-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	8900	20.		26-JUN-96	38440	L7305-153
Alkalinity, total (as CaCO3)	mg/L	310.1	460	10.		28-JUN-96	38432	L7305-153
Chloride	mg/L	325.2	5000	100	D(1:100)	02-JUL-96	38433	L7305-153
Nitrate-Nitrite-Nitrogen	mg/L	353.2	0.21	0.050		26-JUN-96	38434	L7305-134
SULFATE	mg/L	375.4	730	100	D(1:20)	03-JUL-96	38436	L7305-153

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: C6-R37	Date Collected: 20-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	6900	20.		26-JUN-96	38440	L7305-154
Alkalinity, total (as CaCO3)	mg/L	310.1	560	10.		28-JUN-96	38432	L7305-154
Chloride	mg/L	325.2	4600	100	D(1:100)	02-JUL-96	38433	L7305-154
Nitrate-Nitrite-Nitrogen	mg/L	353.2	0.070	0.050		26-JUN-96	38434	L7305-135
SULFATE	mg/L	375.4	270	100	D(1:20)	03-JUL-96	38436	L7305-154

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: C2-64	Date Collected: 20-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	11000	20.		26-JUN-96	38440	L7305-155
Alkalinity, total (as CaCO3)	mg/L	310.1	1000	10.		28-JUN-96	38432	L7305-155
Chloride	mg/L	325.2	6300	100	D(1:100)	02-JUL-96	38433	L7305-155
Nitrate-Nitrite-Nitrogen	mg/L	353.2	0.030	0.050	B	26-JUN-96	38434	L7305-136
SULFATE	mg/L	375.4	990	250	D(1:50)	03-JUL-96	38436	L7305-155

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: C7-54	Date Collected: 20-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	15000	20.		26-JUN-96	38440	L7305-156
Alkalinity, total (as CaCO3)	mg/L	310.1	320	10.		28-JUN-96	38432	L7305-156
Chloride	mg/L	325.2	9800	100	D(1:100)	02-JUL-96	38433	L7305-156
Nitrate-Nitrite-Nitrogen	mg/L	353.2	0.075	0.050		26-JUN-96	38434	L7305-137
SULFATE	mg/L	375.4	1400	250	D(1:50)	03-JUL-96	38436	L7305-156

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: D8-50	Date Collected: 20-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	8600	20.		26-JUN-96	38440	L7305-157
Alkalinity, total (as CaCO3)	mg/L	310.1	860	10.		28-JUN-96	38432	L7305-157
Chloride	mg/L	325.2	4300	100	D(1:100)	02-JUL-96	38433	L7305-157
Nitrate-Nitrite-Nitrogen	mg/L	353.2	< 0.020	0.050	U	26-JUN-96	38434	L7305-138
SULFATE	mg/L	375.4	1500	250	D(1:50)	03-JUL-96	38436	L7305-157

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: D8-48	Date Collected: 20-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	10000	20.		26-JUN-96	38440	L7305-158
Alkalinity, total (as CaCO3)	mg/L	310.1	430	10.		28-JUN-96	38432	L7305-158
Chloride	mg/L	325.2	5100	100	D(1:100)	02-JUL-96	38433	L7305-158
Nitrate-Nitrite-Nitrogen	mg/L	353.2	7.2	0.050		26-JUN-96	38434	L7305-139
SULFATE	mg/L	375.4	2200	500	D(1:100)	03-JUL-96	38436	L7305-158

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: D7-51	Date Collected: 20-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	11000	20.		26-JUN-96	38440	L7305-159
Alkalinity, total (as CaCO3)	mg/L	310.1	1000	10.		28-JUN-96	38432	L7305-159
Chloride	mg/L	325.2	6200	100	D(1:100)	02-JUL-96	38433	L7305-159
Nitrate-Nitrite-Nitrogen	mg/L	353.2	< 0.020	0.050	U	26-JUN-96	38434	L7305-140
SULFATE	mg/L	375.4	1300	250	D(1:50)	03-JUL-96	38436	L7305-159

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: D7-33	Date Collected: 20-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	7000	20.		26-JUN-96	38440	L7305-160
Alkalinity, total (as CaCO3)	mg/L	310.1	600	10.		28-JUN-96	38432	L7305-160
Chloride	mg/L	325.2	2900	100	D(1:100)	02-JUL-96	38433	L7305-160
Nitrate-Nitrite-Nitrogen	mg/L	353.2	< 0.020	0.050	U	26-JUN-96	38434	L7305-141
SULFATE	mg/L	375.4	1300	250	D(1:50)	03-JUL-96	38436	L7305-160

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: C6-R04	Date Collected: 21-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	5600	20.		26-JUN-96	38440	L7305-161
Alkalinity, total (as CaCO3)	mg/L	310.1	520	10.		28-JUN-96	38432	L7305-161
Chloride	mg/L	325.2	3400	100	D(1:100)	02-JUL-96	38433	L7305-161
Nitrate-Nitrite-Nitrogen	mg/L	353.2	0.14	0.050		26-JUN-96	38434	L7305-142
SULFATE	mg/L	375.4	220	50.	D(1:10)	03-JUL-96	38436	L7305-161

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: C6-R36	Date Collected: 21-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	5800	20.		26-JUN-96	38440	L7305-163
Alkalinity, total (as CaCO3)	mg/L	310.1	570	10.		28-JUN-96	38432	L7305-163
Chloride	mg/L	325.2	3700	100	D(1:100)	01-JUL-96	38433	L7305-163
Nitrate-Nitrite-Nitrogen	mg/L	353.2	0.042	0.050	B	26-JUN-96	38434	L7305-144
SULFATE	mg/L	375.4	200	50.	D(1:10)	03-JUL-96	38436	L7305-163

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: D6-R34	Date Collected: 21-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	3200	20.		26-JUN-96	38440	L7305-164
Alkalinity, total (as CaCO3)	mg/L	310.1	720	10.		28-JUN-96	38432	L7305-164
Chloride	mg/L	325.2	1600	100	D(1:100)	01-JUL-96	38433	L7305-164
Nitrate-Nitrite-Nitrogen	mg/L	353.2	0.030	0.050	B	26-JUN-96	38434	L7305-145
SULFATE	mg/L	375.4	11.	5.0		03-JUL-96	38436	L7305-164

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: B8-D1	Date Collected: 21-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	6000	20.		26-JUN-96	38440	L7305-165
Alkalinity, total (as CaCO3)	mg/L	310.1	610	10.		28-JUN-96	38432	L7305-165
Chloride	mg/L	325.2	3700	100	D(1:100)	01-JUL-96	38433	L7305-165
Nitrate-Nitrite-Nitrogen	mg/L	353.2	0.040	0.050	B	26-JUN-96	38434	L7305-146
SULFATE	mg/L	375.4	220	50.	D(1:10)	03-JUL-96	38436	L7305-165

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: D7-34	Date Collected: 21-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	8200	20.		26-JUN-96	38440	L7305-166
Alkalinity, total (as CaCO3)	mg/L	310.1	8700	250	D(1:25)	01-JUL-96	38432	L7305-166
Chloride	mg/L	325.2	4000	100	D(1:100)	01-JUL-96	38433	L7305-166
Nitrate-Nitrite-Nitrogen	mg/L	353.2	0.11	0.050		26-JUN-96	38434	L7305-147
SULFATE	mg/L	375.4	1600	500	D(1:100)	03-JUL-96	38436	L7305-166

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: D7-15	Date Collected: 21-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	6700	20.		26-JUN-96	38440	L7305-167
Alkalinity, total (as CaCO3)	mg/L	310.1	820	10.		28-JUN-96	38432	L7305-167
Chloride	mg/L	325.2	3200	100	D(1:100)	01-JUL-96	38433	L7305-167
Nitrate-Nitrite-Nitrogen	mg/L	353.2	< 0.020	0.050	U	26-JUN-96	38434	L7305-148
SULFATE	mg/L	375.4	1300	500	D(1:100)	03-JUL-96	38436	L7305-167

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: I3-67	Date Collected: 21-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	2100	20.		26-JUN-96	38440	L7305-168
Alkalinity, total (as CaCO3)	mg/L	310.1	360	10.		28-JUN-96	38432	L7305-168
Chloride	mg/L	325.2	870	100	D(1:100)	01-JUL-96	38433	L7305-168
Nitrate-Nitrite-Nitrogen	mg/L	353.2	0.65	0.050		26-JUN-96	38434	L7305-149
SULFATE	mg/L	375.4	100	25.	D(1:5)	03-JUL-96	38436	L7305-168

CALIBRATION AND QC SUMMARY SHEETS

LOCKHEED ANALYTICAL LABORATORIES

WATER QUALITY PARAMETERS

CALIBRATON SUMMARY

SDG: N/A	UNITS: mg/L
LAL BATCH: 624-Dm	Date weights calibrated: 2/09/96
METHOD: 160.1	
ANALYTE: Total Dissolved Solids	Balance ID: 23548
Manufacturer: Troemner	Lot #: 2512

ANALYTICAL BALANCE DATA

WEIGHT TYPE (Grams)	BALANCE CRITERIA (Upper Limit)	BALANCE CRITERIA (Lower Limit)	BALANCE RESPONSE (Grams)	DATE BALANCE CALIBRATION	LOG BOOK NUMBER
50.0 g	50.0060	49.9960	49.9989	6/28/96	0245
5.0 g	5.0010	4.9900	4.9993	"	0245
0.5 g	0.5010	0.4990	0.4999	"	0245

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
QUALITY CONTROL DATA SUMMARY

SDG: N/A	ANALYTE: Total Dissolved Solids
LAL BATCH: 624-Dm	UNITS: mg/L

LABORATORY CONTROL SAMPLES

LCS ID	ACCEPTANCE LIMITS (%R)	TRUE VALUE	FOUND VALUE	% RECOVERY
TDS LCS	100(+/-)15	1000	1064	106.4%
TDS LCSD	100(+/-)15	1000	—	—

LABORATORY DUPLICATE SAMPLES

CLIENT SAMPLE ID	ACCEPTANCE LIMITS	SAMPLE VALUE	DUPLICATE	RPD
TDS LCS/TDS LCSD	10	—	—	—
	10	5690	5630	1.06

MATRIX BLANK SAMPLES

LAL SAMPLE ID	ANALYSIS RESULTS
PB	10U

LOCKHEED ANALYTICAL LABORATORIES

WATER QUALITY PARAMETERS

CALIBRATON SUMMARY

SDG: N/A	UNITS: mg/L
LAL BATCH: 624-Dmx ~~619-TDS~~ AS 7-2-96	Date weights calibrated: 2/09/96
METHOD: 160.1	
ANALYTE: Total Dissolved Solids	Balance ID: 23548
Manufacturer: Troemner	Lot #: 2512

ANALYTICAL BALANCE DATA

WEIGHT TYPE (Grams)	BALANCE CRITERIA (Upper Limit)	BALANCE CRITERIA (Lower Limit)	BALANCE RESPONSE (Grams)	DATE BALANCE CALIBRATION	LOG BOOK NUMBER
50.0 g	50.0050	49.9950	49.9988	7-2-96	0245
5.0 g	5.0010	4.9900	4.9999	"	0245
0.5 g	0.5010	0.4990	0.5000	—	0245

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
QUALITY CONTROL DATA SUMMARY

SDG: N/A	ANALYTE: Total Dissolved Solids
LAL BATCH: 624-Dm x	UNITS: mg/L

LABORATORY CONTROL SAMPLES

LCS ID	ACCEPTANCE LIMITS (%R)	TRUE VALUE	FOUND VALUE	% RECOVERY
TDS LCS	100(+/-)15	1000	1008	100.8%
TDS LCSD	100(+/-)15	1000	—	—

LABORATORY DUPLICATE SAMPLES

CLIENT SAMPLE ID	ACCEPTANCE LIMITS	SAMPLE VALUE	DUPLICATE	RPD
TDS LCS/TDS LCSD	10	—	—	
B4-61	10	3120	2890	7.65

MATRIX BLANK SAMPLES

LAL SAMPLE ID	ANALYSIS RESULTS
PB	104

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
CALIBRATION SUMMARY

SDG: NA	UNITS: mg/L	CONSTANT: NA
LAL BATCH #: 624-DM	CALIBRATION DATE: 6/28/96	LINEAR COEFFICIENT: NA
METHOD: 310.1	CALIBRATION TIME: NA	QUADRATIC COEFFICIENT: NA
ANALYTE: CaCO3	NUMBER OF STANDARDS: 1	CUBIC COEFFICIENT: NA
INSTRUMENT: 960 ORION	CALIBRATION TYPE: LINEAR	COEFFICIENT OF DETERMINATION: NA

STANDARD DATA

STANDARD ID	MANUFACTURER	LOT #	TRUE VALUE (M)	INSTRUMENT RESPONSE	CALCULATED CONCENTRATION
ANE	MALLINCKRODT	7527KECR	0.025	NA	0.025 M

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND	% RECOVERY
ICV	5001.006 mg/L	4953.655 mg/L	99.05

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND
ICB	NA	10U

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND	% RECOVERY
CCV	5001.006 mg/L	5078.596 mg/L	101.55

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND
CCB	NA	10U

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
QUALITY CONTROL DATA SUMMARY

SDG: NA	ANALYTE: CaCO3
LAL BATCH #: 624-DM	UNITS: mg/L

LABORATORY CONTROL SAMPLES

LCS ID	ACCEPTANCE LIMITS (%R)	ANALYTE	TRUE VALUE mg/L	FOUND VALUE mg/L	% RECOVERY
LCS	80-120	TOTAL ALKA.	5001.006 mg/L	4929.785 mg/L	98.58 %

MATRIX SPIKE SAMPLES

CLIENT SAMPLE ID	ACCEPTANCE LIMITS (%R)	SPIKED SAMPLE RESULTS	SAMPLE RESULTS	SPIKE ADDED	% RECOVERY
NA					

LABORATORY DUPLICATE SAMPLES

CLIENT SAMPLE ID	ACCEPTANCE LIMITS (RPD)	SAMPLE VALUE	DUPLICATE VALUE	% RPD
C6-R04	20	517.445 mg/L	514.051 mg/L	0.7

FIELD DUPLICATE SAMPLES

CLIENT SAMPLE ID	CLIENT DUPLICATE SAMPLE ID	SAMPLE VALUE	DUPLICATE VALUE	% RPD

FIELD BLANK SAMPLES

CLIENT SAMPLE ID	ANALYSIS RESULTS
NA	

EXTRACTION BLANK

LAL SAMPLE ID	ANALYSIS RESULTS
NA	

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
CALIBRATION SUMMARY

SDG: NA	UNITS: mg/L	CONSTANT: NA
LAL BATCH #: 624-DM	CALIBRATION DATE: 7/1/96	LINEAR COEFFICIENT: NA
METHOD: 310.1	CALIBRATION TIME: NA	QUADRATIC COEFFICIENT: NA
ANALYTE: CaCO3	NUMBER OF STANDARDS: 1	CUBIC COEFFICIENT: NA
INSTRUMENT: 960 ORION	CALIBRATION TYPE: LINEAR	COEFFICIENT OF DETERMINATION: NA

STANDARD DATA

STANDARD ID	MANUFACTURER	LOT #	TRUE VALUE (M)	INSTRUMENT RESPONSE	CALCULATED CONCENTRATION
ANE	MALLINCKRODT	7527KECR	0.025	NA	0.025 M

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND	% RECOVERY
ICV	5001.006 mg/L	4995.373 mg/L	99.89

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND
ICB	NA	10U

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND	% RECOVERY
CCV	5001.006 mg/L	5067.003 mg/L	101.32

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND
CCB	NA	10U

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
QUALITY CONTROL DATA SUMMARY

SDG: NA	ANALYTE: CaCO3
LAL BATCH #: 624-DM	UNITS: mg/L

LABORATORY CONTROL SAMPLES

LCS ID	ACCEPTANCE LIMITS (%R)	ANALYTE	TRUE VALUE mg/L	FOUND VALUE mg/L	% RECOVERY
LCS	80-120	TOTAL ALKA.	5001.006 mg/L	4993.498 mg/L	99.85 %

MATRIX SPIKE SAMPLES

CLIENT SAMPLE ID	ACCEPTANCE LIMITS (%R)	SPIKED SAMPLE RESULTS	SAMPLE RESULTS	SPIKE ADDED	% RECOVERY
NA					

LABORATORY DUPLICATE SAMPLES

CLIENT SAMPLE ID	ACCEPTANCE LIMITS (RPD)	SAMPLE VALUE	DUPLICATE VALUE	% RPD
D7-34	20	8688.461 mg/L	8616.268 mg/L	0.8

FIELD DUPLICATE SAMPLES

CLIENT SAMPLE ID	CLIENT DUPLICATE SAMPLE ID	SAMPLE VALUE	DUPLICATE VALUE	% RPD

FIELD BLANK SAMPLES

CLIENT SAMPLE ID	ANALYSIS RESULTS
NA	

EXTRACTION BLANK

LAL SAMPLE ID	ANALYSIS RESULTS
NA	

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
CALIBRATION SUMMARY

SDG: NA	UNITS: mg/L	CONSTANT: NA
LAL BATCH #: 624-DMX	CALIBRATION DATE: 7/2/96	LINEAR COEFFICIENT: NA
METHOD: 310.1	CALIBRATION TIME: NA	QUADRATIC COEFFICIENT: NA
ANALYTE: CaCO3	NUMBER OF STANDARDS: 1	CUBIC COEFFICIENT: NA
INSTRUMENT: 960 ORION	CALIBRATION TYPE: LINEAR	COEFFICIENT OF DETERMINATION: NA

STANDARD DATA

STANDARD ID	MANUFACTURER	LOT #	TRUE VALUE (M)	INSTRUMENT RESPONSE	CALCULATED CONCENTRATION
ANE	MALLINCKRODT	7527KECR	0.025	NA	0.025 M

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND	% RECOVERY
ICV	5001.006 mg/L	5029.876 mg/L	100.58

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND
ICB	NA	10U

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND	% RECOVERY
CCV	5001.006 mg/L	5059.128 mg/L	101.16

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND
CCB	NA	10U

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
QUALITY CONTROL DATA SUMMARY

SDG: NA	ANALYTE: CaCO3
LAL BATCH #: 624-DMX	UNITS: mg/L

LABORATORY CONTROL SAMPLES

LCS ID	ACCEPTANCE LIMITS (%R)	ANALYTE	TRUE VALUE mg/L	FOUND VALUE mg/L	% RECOVERY
LCS	80-120	TOTAL ALKA.	5001.006 mg/L	4978.872 mg/L	99.56 %

MATRIX SPIKE SAMPLES

CLIENT SAMPLE ID	ACCEPTANCE LIMITS (%R)	SPIKED SAMPLE RESULTS	SAMPLE RESULTS	SPIKE ADDED	% RECOVERY
NA					

LABORATORY DUPLICATE SAMPLES

CLIENT SAMPLE ID	ACCEPTANCE LIMITS (RPD)	SAMPLE VALUE	DUPLICATE VALUE	% RPD
B4-61	20	1082.968 mg/L	1056.341 mg/L	2.5

FIELD DUPLICATE SAMPLES

CLIENT SAMPLE ID	CLIENT DUPLICATE SAMPLE ID	SAMPLE VALUE	DUPLICATE VALUE	% RPD

FIELD BLANK SAMPLES

CLIENT SAMPLE ID	ANALYSIS RESULTS
NA	

EXTRACTION BLANK

LAL SAMPLE ID	ANALYSIS RESULTS
NA	

LOCKHEED ANALYTICAL SERVICES – FIA Initial Calibration Summary

SDG:		UNITS:	mg/L	INTERCEPT	-19.96068
LAL BATCH:	624-dm	CALIB. DATE:	07-01-1996	LINEAR COEFF	45.06367
METHOD:	325.2	WORKSHEET #:	960701B	QUADRATIC COEFF	-9.398448E
ANALYTE:	Cl	# OF STANDARDS:	7	CORRELATION COEFF	.9997951
INSTRUMENT:	FIA	CALIBRATION TYPE:	QUADRATIC		

STANDARD DATA

STANDARD ID	MANUFACTURER	LOT #	TRUE VALUE	HEIGHT
S1: 0	MALLINCKRODT	6858KDPG	0	0
S2: 1	MALLINCKRODT	6858KDPG	1	34
S3: 2	MALLINCKRODT	6858KDPG	2	58
S4: 5	MALLINCKRODT	6858KDPG	5	178
S5: 25	MALLINCKRODT	6858KDPG	25	1058
S6: 50	MALLINCKRODT	6858KDPG	50	1996
~~S7: 100~~	~~MALLINCKRODT~~	~~6858KDPG~~	~~100~~	~~0~~

AB 7/3/96

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND	% RECOVERY
ICV	10	40	39.33	98.3%
~~ICV~~	~~84~~	~~40~~	~~38.244~~	~~95.6%~~

AB 7/3/96

INITIAL CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND
ICB	11	1 u
~~ICB~~	~~85~~	~~33.387 B~~

AB 7/3/96

LOCKHEED ANALYTICAL SERVICES – FIA Continuing Calibration Summary

SDG:		UNITS:	mg/L	INTERCEPT	-19.96068
LAL BATCH:	624-dm	CALIB. DATE:	07-01-1996	LINEAR COEFF	45.06367
METHOD:	325.2	WORKSHEET #:	00:00:00	QUADRATIC COEFF	-9.398448E
ANALYTE:	Cl	# OF STANDARDS:	7	CORRELATION COEFF	.9997951
INSTRUMENT:	FIA	CALIBRATION TYPE:	QUADRATIC		

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND	% RECOVERY
CCV	14	50	48.096	96.2%
CCV	38	50	47.735	95.5%
CCV	62	50	47.652	95.3%
~~CCV~~	~~79~~	~~50~~	~~0.888~~	~~1.8%~~
~~CCV~~	~~106~~	~~50~~	~~2.542~~	~~5.1%~~
~~CCV~~	~~116~~	~~50~~	~~0.443~~	~~0.9%~~

KB 1/3/96

CONTINUING CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND	
CCB	15	1	u
CCB	39	1	u
CCB	63	1	u
~~CCB~~	~~80~~	~~1~~	~~u~~
~~CCB~~	~~107~~	~~4.547~~	~~B~~

KB 1/3/96

LOCKHEED ANALYTICAL SERVICES – FIA Initial Calibration Summary

SDG:		UNITS:	mg/L	INTERCEPT	-18.10177
LAL BATCH:	624-dm	CALIB. DATE:	07-02-1996	LINEAR COEFF	22.8126
METHOD:	325.2	WORKSHEET #:	960702A	QUADRATIC COEFF	-3.443512E
ANALYTE:	Cl	# OF STANDARDS:	7	CORRELATION COEFF	.9998199
INSTRUMENT:	FIA	CALIBRATION TYPE:	QUADRATIC		

STANDARD DATA

STANDARD ID	MANUFACTURER	LOT #	TRUE VALUE	HEIGHT
S1: 0	MALLINCKRODT	6858KDPG	0	0
S2: 1	MALLINCKRODT	6858KDPG	1	11
S3: 2	MALLINCKRODT	6858KDPG	2	22
S4: 5	MALLINCKRODT	6858KDPG	5	80
S5: 25	MALLINCKRODT	6858KDPG	25	514
S6: 50	MALLINCKRODT	6858KDPG	50	1052
S7: 100	MALLINCKRODT	6858KDPG	100	1916

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND	% RECOVERY
ICV	10	40	40.984	102.5%

INITIAL CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND
ICB	11	1 u

LOCKHEED ANALYTICAL SERVICES – FIA Continuing Calibration Summary

SDG:		UNITS:	mg/L	INTERCEPT	-18.10177
LAL BATCH:	624-dm	CALIB. DATE:	07-02-1996	LINEAR COEFF	22.8126
METHOD:	325.2	WORKSHEET #:	00:00:00	QUADRATIC COEFF	-3.443512E
ANALYTE:	Cl	# OF STANDARDS:	7	CORRELATION COEFF	.9998199
INSTRUMENT:	FIA	CALIBRATION TYPE:	QUADRATIC		

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND	% RECOVERY
CCV	14	50	46.488	93.0%
CCV	38	50	46.795	93.6%
~~CCV~~	~~62~~	~~50~~	~~36.762~~	~~73.5%~~
~~CCV~~	~~70~~	~~50~~	~~0.794~~	~~1.6%~~

KB 1/3/96

CONTINUING CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND
CCB	15	1 u
CCB	39	1 u
~~CCB~~	~~63~~	~~1 u~~
~~CCB~~	~~71~~	~~1 u~~

KB 1/3/96

LOCKHEED ANALYTICAL LABORATORY
QUALITY CONTROL DATA SUMMARY
LCS AND MATRIX BLANK ANALYSES

SDG: Worksheet: 960702A

Batch ID: 624-dm

LABORATORY CONTROL SAMPLES

LCS ID	ANALYTE	ACCEPTANCE LIMITS (%R)	TRUE VALUE	FOUND VALUE	% RECOVERY	FLAG	UNITS
LCS	Cl	80–120	10	10.2	102.0%		mg/L

MATRIX BLANK SAMPLES

LAL SAMPLE ID	ANALYTE	RESULT	FLAG	UNITS
PB	Cl	< 1	U	mg/L

Km 7-3-96

LOCKHEED ANALYTICAL LABORATORY
QUALITY CONTROL DATA SUMMARY
SPIKE AND DUPLICATE SAMPLES

SDG: Worksheet: 960702A

Batch ID: 624–dm

MATRIX SPIKE SAMPLES

SAMPLE ID	ACCEPTANCE LIMITS (%R)	ANALYTE	SPIKED SAMPLE RESULT	SAMPLE RESULT	SPIKE ADDED	% RECOVERY	FLAG	UNITS
L7305–161S	75 – 125	Cl	3420.916	3391.6	10	a		mg/L

LABORATORY DUPLICATE SAMPLES

SAMPLE ID	ACCEPTANCE LIMITS (%R)	ANALYTE	SAMPLE RESULT	DUPLICATE RESULT	RPD	FLAG	UNITS
L7305–161D	85 – 115	Cl	3391.6	3411.141	0.6%		mg/L

LOCKHEED ANALYTICAL SERVICES – FIA Initial Calibration Summary

SDG:		UNITS:	mg/L	INTERCEPT	-19.96068
LAL BATCH:	624-DMX	CALIB. DATE:	07-01-1996	LINEAR COEFF	45.06367
METHOD:	325.2	WORKSHEET #:	960701B	QUADRATIC COEFF	-9.398448E
ANALYTE:	Cl	# OF STANDARDS:	7	CORRELATION COEFF	.9997951
INSTRUMENT:	FIA	CALIBRATION TYPE:	QUADRATIC		

STANDARD DATA

STANDARD ID	MANUFACTURER	LOT #	TRUE VALUE	HEIGHT
S1: 0	MALLINCKRODT	6858KDPG	0	0
S2: 1	MALLINCKRODT	6858KDPG	1	34
S3: 2	MALLINCKRODT	6858KDPG	2	58
S4: 5	MALLINCKRODT	6858KDPG	5	178
S5: 25	MALLINCKRODT	6858KDPG	25	1058
S6: 50	MALLINCKRODT	6858KDPG	50	1996
~~S7: 100~~	~~MALLINCKRODT~~	~~6858KDPG~~	~~100~~	~~0~~

AD 7/1/96 overrange

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND	% RECOVERY
ICV	10	40	39.33	98.3%
~~ICV~~	~~84~~	~~40~~	~~38.244~~	~~95.6%~~

AD 7/2/96

INITIAL CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND
ICB	11	1 u
~~ICB~~	~~85~~	~~35.387 B~~

AD 7/2/96

LOCKHEED ANALYTICAL SERVICES – FIA Continuing Calibration Summary

SDG:		UNITS:	mg/L	INTERCEPT	-19.96068
LAL BATCH:	624-DMX	CALIB. DATE:	07-01-1996	LINEAR COEFF	45.06367
METHOD:	325.2	WORKSHEET #:	00:00:00	QUADRATIC COEFF	-9.398448E
ANALYTE:	Cl	# OF STANDARDS:	7	CORRELATION COEFF	.9997951
INSTRUMENT:	FIA	CALIBRATION TYPE:	QUADRATIC		

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND	% RECOVERY
CCV	14	50	48.096	96.2%
CCV	38	50	47.735	95.5%
CCV	62	50	47.652	95.3%
~~CCV~~	~~79~~	~~50~~	~~0.888~~	~~1.8%~~
~~CCV~~	~~106~~	~~50~~	~~2.342~~	~~5.1%~~
~~CCV~~	~~116~~	~~50~~	~~0.443~~	~~0.9%~~

7/1/96

CONTINUING CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND	
CCB	15	1	u
CCB	39	1	u
~~CCB~~	~~63~~	~~1~~	~~u~~
~~CCB~~	~~80~~	~~1~~	~~u~~
~~CCB~~	~~107~~	~~4.547~~	~~B~~

CCB 63 1U OK 7/2/96

7/1/96

LOCKHEED ANALYTICAL LABORATORY
QUALITY CONTROL DATA SUMMARY
LCS AND MATRIX BLANK ANALYSES

SDG: Worksheet: 960701B

Batch ID: 624-DMX

LABORATORY CONTROL SAMPLES

LCS ID	ANALYTE	ACCEPTANCE LIMITS (%R)	TRUE VALUE	FOUND VALUE	% RECOVERY	FLAG	UNITS
LCS	Cl	80 - 120	10	9.231	92.3%		mg/L

MATRIX BLANK SAMPLES

LAL SAMPLE ID	ANALYTE	RESULT	FLAG	UNITS
PB	Cl	U		mg/L

LOCKHEED ANALYTICAL LABORATORY
QUALITY CONTROL DATA SUMMARY
SPIKE AND DUPLICATE SAMPLES

SDG: Worksheet: 960701B

Batch ID: 624-DMX

MATRIX SPIKE SAMPLES

SAMPLE ID	ACCEPTANCE LIMITS (%R)	ANALYTE	SPIKED SAMPLE RESULT	SAMPLE RESULT	SPIKE ADDED	% RECOVERY		FLAG	UNITS
L7305-102S	75 - 125	Cl	1190.028	1325.862	10	a	*		mg/L

0

LABORATORY DUPLICATE SAMPLES

SAMPLE ID	ACCEPTANCE LIMITS (%R)	ANALYTE	SAMPLE RESULT	DUPLICATE RESULT	RPD	FLAG	UNITS
L7305-102D	0 - 15	Cl	1325.862	1173.689	12.2%		mg/L

LOCKHEED ANALYTICAL SERVICES – FIA Initial Calibration Summary

SDG:		UNITS:	mg/L	INTERCEPT	-1.08341
LAL BATCH:	624-dm	CALIB. DATE:	06-26-1996	LINEAR COEFF	403.0304
METHOD:	353.2	WORKSHEET #:	960626A	QUADRATIC COEFF	.7668846
ANALYTE:	NO2+N03-N	# OF STANDARDS:	7	CORRELATION COEFF	.9999974
INSTRUMENT:	FIA	CALIBRATION TYPE:	QUADRATIC		

STANDARD DATA

STANDARD ID	MANUFACTURER	LOT #	TRUE VALUE	HEIGHT
S1: 0	EM SCIENCE	30342105	0	0
S2: .05	EM SCIENCE	30342105	0.05	17
S3: .2	EM SCIENCE	30342105	0.2	81
S4: 1	EM SCIENCE	30342105	1	405
S5: 2	EM SCIENCE	30342105	2	803
S6: 4	EM SCIENCE	30342105	4	1626
S7: 8.01	EM SCIENCE	30342105	8.01	3276

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND	% RECOVERY
ICV	11	3	2.99	99.7%

INITIAL CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND
ICB	12	0.02 u

LOCKHEED ANALYTICAL SERVICES – FIA Continuing Calibration Summary

SDG:		UNITS:	mg/L	INTERCEPT	-1.08341
LAL BATCH:	624-dm	CALIB. DATE:	06-26-1996	LINEAR COEFF	403.0304
METHOD:	353.2	WORKSHEET #:	00:00:00	QUADRATIC COEFF	.7668846
ANALYTE:	NO2+N03-N	# OF STANDARDS:	7	CORRELATION COEFF	.9999974
INSTRUMENT:	FIA	CALIBRATION TYPE:	QUADRATIC		

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND	% RECOVERY
CCV	14	4	3.985	99.6%
CCV	38	4	3.909	97.7%
CCV	56	4	3.831	95.8%
CCV	69	4	3.835	95.9%
~~CCV~~	~~77~~	~~4~~	~~1.544~~	~~38.6%~~

KD 6/20/96

CONTINUING CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND
CCB	15	0.02 u
CCB	39	0.02 u
CCB	57	0.02 u
CCB	70	0.02 u
~~CCB~~	~~78~~	~~0.02 u~~

KD 6/20/96

LOCKHEED ANALYTICAL LABORATORY
QUALITY CONTROL DATA SUMMARY
LCS AND MATRIX BLANK ANALYSES

SDG: Worksheet: 960626A

Batch ID: 624-dm

LABORATORY CONTROL SAMPLES

LCS ID	ANALYTE	ACCEPTANCE LIMITS (%R)	TRUE VALUE	FOUND VALUE	% RECOVERY	FLAG	UNITS
NO3	NO2+N03-N	80-120	4	3.909	97.7%		mg/L
LCS	NO2+N03-N	80-120	5	5.055	101.1%		mg/L

MATRIX BLANK SAMPLES

LAL SAMPLE ID	ANALYTE	RESULT	FLAG	UNITS
PB	NO2+N03-N	0.02	B	mg/L

LOCKHEED ANALYTICAL LABORATORY
QUALITY CONTROL DATA SUMMARY
SPIKE AND DUPLICATE SAMPLES

SDG: Worksheet: 960626A

Batch ID: 624–dm

MATRIX SPIKE SAMPLES

SAMPLE ID	ACCEPTANCE LIMITS (%R)	ANALYTE	SPIKED SAMPLE RESULT	SAMPLE RESULT	SPIKE ADDED	% RECOVERY	FLAG	UNITS
L7305–142S	75 – 125	NO2+N03–N	5.111	0.139	5	99.4%		mg/L

LABORATORY DUPLICATE SAMPLES

SAMPLE ID	ACCEPTANCE LIMITS (%R)	ANALYTE	SAMPLE RESULT	DUPLICATE RESULT	RPD	FLAG	UNITS
L7305–142D	85 – 115	NO2+N03–N	0.139	0.114			mg/L

Km 6-28-96

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
CALIBRATION SUMMARY

SDG: N/A	UNITS: mg/L	CONSTANT: -1.91775
LAL BATCH: 624-dm	CALIBRATION DATE: 7/3/96	LINEAR COEFFICIENT: 3.80345
METHOD: 375.4	CALIBRATION TIME: 4:30 p.m.	QUADRATIC COEFFICIENT: N/A
ANALYTE: Sulfate	NUMBER OF STANDARDS: 5	CUBIC COEFFICIENT: N/A
INSTRUMENT: HF DRT 100B	CALIBRATION TYPE: Linear	COEFFICIENT OF DETERMINATION (r^2): 0.9990555

STANDARD DATA

STANDARD ID	MANUFACTURER	LOT #	TRUE VALUE	INSTRUMENT RESPONSE (NTU)	CALCULATED CONCENTRATION
1	Mallinckrodt	8024 KEMC	0.0	0.87	0.73
2	"	"	5.0	15.5	4.58
3	"	"	10.0	34.5	9.57
4	"	"	20.0	73.8	19.9
5	"	"	40.0	151	40.2

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND	% RECOVERY
ICV	20.0	19.17	95.9

INITIAL CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND
ICB	N/A	1.00 U

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND VALUE	% RECOVERY
CCV1	N/A	20.0	19.20	96.0
CCV2	N/A	20.0	19.57	97.9
CCV3	N/A	20.0	20.28	101.4

CONTINUING CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND
CCB1	N/A	1.00 U
CCB2	N/A	1.00 U
CCB3	N/A	1.16 B

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
QUALITY CONTROL DATA SUMMARY

SDG: N/A	ANALYTE: Turbidimetric Sulfate
LAL BATCH: 624-dm	UNITS: mg/L

LABORATORY CONTROL SAMPLES

LCS ID	ACCEPTANCE LIMITS (%R)	TRUE VALUE	FOUND VALUE	% RECOVERY
lcs624dm	80-120	10.0	9.29	92.9

MATRIX SPIKE SAMPLES

CLIENT SAMPLE ID	ACCEPTANCE LIMITS (%R)	SPIKED SAMPLE RESULT	SAMPLE RESULT	SPIKE ADDED	% RECOVERY
C6-R04	75-125	320.55	221.69	10.0(x10)	98.9

LABORATORY DUPLICATE SAMPLES

CLIENT SAMPLE ID	ACCEPTANCE LIMITS (RPD)	SAMPLE VALUE	DUPLICATE VALUE	% RPD
C6-R04	20	221.69	227.73	2.7

FIELD DUPLICATE SAMPLES

CLIENT SAMPLE ID	CLIENT DUPLICATE SAMPLE ID	SAMPLE VALUE	DUPLICATE VALUE	RPD
N/A				

FIELD BLANK SAMPLES

CLIENT SAMPLE ID	ANALYSIS RESULT
N/A	

MATRIX BLANK SAMPLES

LAL SAMPLE ID	ANALYSIS RESULT
pb624dm	1.00 U

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
CALIBRATION SUMMARY

SDG: N/A	UNITS: mg/L	CONSTANT: -1.91775
LAL BATCH: 624-dmX	CALIBRATION DATE: 7/3/96	LINEAR COEFFICIENT: 3.80345
METHOD: 375.4	CALIBRATION TIME: 4:30 p.m.	QUADRATIC COEFFICIENT: N/A
ANALYTE: Sulfate	NUMBER OF STANDARDS: 5	CUBIC COEFFICIENT: N/A
INSTRUMENT: HF DRT 1008	CALIBRATION TYPE: Linear	COEFFICIENT OF DETERMINATION (r^2): 0.9990555

STANDARD DATA

STANDARD ID	MANUFACTURER	LOT #	TRUE VALUE	INSTRUMENT RESPONSE (NTU)	CALCULATED CONCENTRATION
1	Mallinckrodt	8024 KEMC	0.0	0.87	0.73
2	"	"	5.0	15.5	4.58
3	"	"	10.0	34.5	9.57
4	"	"	20.0	73.8	19.9
5	"	"	40.0	151	40.2

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND	% RECOVERY
ICV	20.0	19.17	95.9

INITIAL CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND
ICB	N/A	1.00 U

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND VALUE	% RECOVERY
CCV1	N/A	20.0	19.20	96.0
CCV2	N/A	20.0	19.57	97.9
CCV3	N/A	20.0	20.28	101.4

CONTINUING CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND
CCB1	N/A	1.00 U
CCB2	N/A	1.00 U
CCB3	N/A	1.16 B

METALS RESULTS

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: C6-56	Date Collected: 20-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CADMIUM, TOTAL	mg/l	6010	< 0.0050	0.0050	0.0050	U	1	29-JUN-96	38448	L7305-113
CHROMIUM, TOTAL	mg/l	6010	< 0.0060	0.0060	0.010	U	1	28-JUN-96	38448	L7305-113
NICKEL, TOTAL	mg/l	6010	< 0.013	0.013	0.040	U	1	28-JUN-96	38448	L7305-113
VANADIUM, TOTAL	mg/l	6010	< 0.0070	0.0070	0.050	U	1	28-JUN-96	38448	L7305-113
ARSENIC, TOTAL	mg/l	7060	< 0.0030	0.0030	0.010	U	1	28-JUN-96	38449	L7305-113
LEAD, TOTAL	mg/l	7421	< 0.010	0.010	0.015	U	5	28-JUN-96	38449	L7305-113
MERCURY, TOTAL	mg/L	7470	< 0.00020	0.00020	0.00020	U	1	02-JUL-96	38450	L7305-113

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: C6-58	Date Collected: 20-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CADMIUM, TOTAL	mg/l	6010	< 0.0050	0.0050	0.0050	U	1	29-JUN-96	38448	L7305-114
CHROMIUM, TOTAL	mg/l	6010	< 0.0060	0.0060	0.010	U	1	28-JUN-96	38448	L7305-114
NICKEL, TOTAL	mg/l	6010	< 0.013	0.013	0.040	U	1	28-JUN-96	38448	L7305-114
VANADIUM, TOTAL	mg/l	6010	< 0.0070	0.0070	0.050	U	1	28-JUN-96	38448	L7305-114
ARSENIC, TOTAL	mg/l	7060	< 0.0030	0.0030	0.010	U	1	28-JUN-96	38449	L7305-114
LEAD, TOTAL	mg/l	7421	< 0.010	0.010	0.015	U	5	28-JUN-96	38449	L7305-114
MERCURY, TOTAL	mg/L	7470	< 0.00020	0.00020	0.00020	U	1	02-JUL-96	38450	L7305-114

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: A3-62	Date Collected: 20-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CADMIUM, TOTAL	mg/l	6010	< 0.0050	0.0050	0.0050	U	1	29-JUN-96	38448	L7305-115
CHROMIUM, TOTAL	mg/l	6010	0.012	0.0060	0.010		1	28-JUN-96	38448	L7305-115
NICKEL, TOTAL	mg/l	6010	< 0.013	0.013	0.040	U	1	28-JUN-96	38448	L7305-115
VANADIUM, TOTAL	mg/l	6010	< 0.0070	0.0070	0.050	U	1	28-JUN-96	38448	L7305-115
ARSENIC, TOTAL	mg/l	7060	< 0.0030	0.0030	0.010	U	1	28-JUN-96	38449	L7305-115
LEAD, TOTAL	mg/l	7421	< 0.010	0.010	0.015	U	5	28-JUN-96	38449	L7305-115
MERCURY, TOTAL	mg/L	7470	< 0.00020	0.00020	0.00020	U	1	02-JUL-96	38450	L7305-115

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: C6-R37	Date Collected: 20-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CADMIUM, TOTAL	mg/l	6010	< 0.0050	0.0050	0.0050	U	1	29-JUN-96	38448	L7305-116
CHROMIUM, TOTAL	mg/l	6010	< 0.0060	0.0060	0.010	U	1	28-JUN-96	38448	L7305-116
NICKEL, TOTAL	mg/l	6010	< 0.013	0.013	0.040	U	1	28-JUN-96	38448	L7305-116
VANADIUM, TOTAL	mg/l	6010	< 0.0070	0.0070	0.050	U	1	28-JUN-96	38448	L7305-116
ARSENIC, TOTAL	mg/l	7060	< 0.0030	0.0030	0.010	U	1	28-JUN-96	38449	L7305-116
LEAD, TOTAL	mg/l	7421	< 0.010	0.010	0.015	U	5	28-JUN-96	38449	L7305-116
MERCURY, TOTAL	mg/L	7470	< 0.00020	0.00020	0.00020	U	1	02-JUL-96	38450	L7305-116

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: C2-64	Date Collected: 20-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CADMIUM, TOTAL	mg/l	6010	< 0.0050	0.0050	0.0050	U	1	29-JUN-96	38448	L7305-117
CHROMIUM, TOTAL	mg/l	6010	0.028	0.0060	0.010		1	28-JUN-96	38448	L7305-117
NICKEL, TOTAL	mg/l	6010	0.013	0.013	0.040	B	1	28-JUN-96	38448	L7305-117
VANADIUM, TOTAL	mg/l	6010	0.011	0.0070	0.050	B	1	28-JUN-96	38448	L7305-117
ARSENIC, TOTAL	mg/l	7060	0.0059	0.0030	0.010	B	1	28-JUN-96	38449	L7305-117
LEAD, TOTAL	mg/l	7421	< 0.010	0.010	0.015	U	5	28-JUN-96	38449	L7305-117
MERCURY, TOTAL	mg/L	7470	< 0.00020	0.00020	0.00020	U	1	02-JUL-96	38450	L7305-117

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: C7-54	Date Collected: 20-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CADMIUM, TOTAL	mg/l	6010	< 0.0050	0.0050	0.0050	U	1	29-JUN-96	38448	L7305-118
CHROMIUM, TOTAL	mg/l	6010	< 0.0060	0.0060	0.010	U	1	28-JUN-96	38448	L7305-118
NICKEL, TOTAL	mg/l	6010	< 0.013	0.013	0.040	U	1	28-JUN-96	38448	L7305-118
VANADIUM, TOTAL	mg/l	6010	< 0.0070	0.0070	0.050	U	1	28-JUN-96	38448	L7305-118
ARSENIC, TOTAL	mg/l	7060	< 0.0030	0.0030	0.010	U	1	28-JUN-96	38449	L7305-118
LEAD, TOTAL	mg/l	7421	< 0.010	0.010	0.015	U	5	28-JUN-96	38449	L7305-118
MERCURY, TOTAL	mg/L	7470	< 0.00020	0.00020	0.00020	U	1	02-JUL-96	38450	L7305-118

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: D8-50	Date Collected: 20-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CADMIUM, TOTAL	mg/l	6010	< 0.0050	0.0050	0.0050	U	1	29-JUN-96	38448	L7305-119
CHROMIUM, TOTAL	mg/l	6010	< 0.0060	0.0060	0.010	U	1	28-JUN-96	38448	L7305-119
NICKEL, TOTAL	mg/l	6010	< 0.013	0.013	0.040	U	1	28-JUN-96	38448	L7305-119
VANADIUM, TOTAL	mg/l	6010	0.012	0.0070	0.050	B	1	28-JUN-96	38448	L7305-119
ARSENIC, TOTAL	mg/l	7060	0.0047	0.0030	0.010	B	1	28-JUN-96	38449	L7305-119
LEAD, TOTAL	mg/l	7421	< 0.010	0.010	0.015	U	5	28-JUN-96	38449	L7305-119
MERCURY, TOTAL	mg/L	7470	< 0.00020	0.00020	0.00020	U	1	02-JUL-96	38450	L7305-119

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: D8-48	Date Collected: 20-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CADMIUM, TOTAL	mg/l	6010	< 0.0050	0.0050	0.0050	U	1	29-JUN-96	38448	L7305-120
CHROMIUM, TOTAL	mg/l	6010	< 0.0060	0.0060	0.010	U	1	28-JUN-96	38448	L7305-120
NICKEL, TOTAL	mg/l	6010	< 0.013	0.013	0.040	U	1	28-JUN-96	38448	L7305-120
VANADIUM, TOTAL	mg/l	6010	< 0.0070	0.0070	0.050	U	1	28-JUN-96	38448	L7305-120
ARSENIC, TOTAL	mg/l	7060	0.0071	0.0030	0.010	BS	1	01-JUL-96	38449	L7305-120
LEAD, TOTAL	mg/l	7421	< 0.010	0.010	0.015	U	5	28-JUN-96	38449	L7305-120
MERCURY, TOTAL	mg/L	7470	< 0.00020	0.00020	0.00020	U	1	02-JUL-96	38450	L7305-120

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: D7-51	Date Collected: 20-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CADMIUM, TOTAL	mg/l	6010	< 0.0050	0.0050	0.0050	U	1	29-JUN-96	38448	L7305-121
CHROMIUM, TOTAL	mg/l	6010	< 0.0060	0.0060	0.010	U	1	28-JUN-96	38448	L7305-121
NICKEL, TOTAL	mg/l	6010	< 0.013	0.013	0.040	U	1	28-JUN-96	38448	L7305-121
VANADIUM, TOTAL	mg/l	6010	< 0.0070	0.0070	0.050	U	1	28-JUN-96	38448	L7305-121
ARSENIC, TOTAL	mg/l	7060	< 0.0030	0.0030	0.010	U	1	28-JUN-96	38449	L7305-121
LEAD, TOTAL	mg/l	7421	< 0.010	0.010	0.015	U	5	28-JUN-96	38449	L7305-121
MERCURY, TOTAL	mg/L	7470	< 0.00020	0.00020	0.00020	U	1	02-JUL-96	38450	L7305-121

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: D7-33	Date Collected: 20-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CADMIUM, TOTAL	mg/l	6010	< 0.0050	0.0050	0.0050	U	1	29-JUN-96	38448	L7305-122
CHROMIUM, TOTAL	mg/l	6010	0.039	0.0060	0.010		1	28-JUN-96	38448	L7305-122
NICKEL, TOTAL	mg/l	6010	< 0.013	0.013	0.040	U	1	28-JUN-96	38448	L7305-122
VANADIUM, TOTAL	mg/l	6010	< 0.0070	0.0070	0.050	U	1	28-JUN-96	38448	L7305-122
ARSENIC, TOTAL	mg/l	7060	< 0.0030	0.0030	0.010	U	1	28-JUN-96	38449	L7305-122
LEAD, TOTAL	mg/l	7421	< 0.010	0.010	0.015	U	5	28-JUN-96	38449	L7305-122
MERCURY, TOTAL	mg/L	7470	< 0.00020	0.00020	0.00020	U	1	02-JUL-96	38450	L7305-122

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: C6-R04	Date Collected: 21-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CADMIUM, TOTAL	mg/l	6010	< 0.0050	0.0050	0.0050	U	1	29-JUN-96	38448	L7305-123
CHROMIUM, TOTAL	mg/l	6010	< 0.0060	0.0060	0.010	U	1	28-JUN-96	38448	L7305-123
NICKEL, TOTAL	mg/l	6010	< 0.013	0.013	0.040	U	1	28-JUN-96	38448	L7305-123
VANADIUM, TOTAL	mg/l	6010	< 0.0070	0.0070	0.050	U	1	28-JUN-96	38448	L7305-123
ARSENIC, TOTAL	mg/l	7060	< 0.0030	0.0030	0.010	U	1	28-JUN-96	38449	L7305-123
LEAD, TOTAL	mg/l	7421	< 0.010	0.010	0.015	U	5	28-JUN-96	38449	L7305-123
MERCURY, TOTAL	mg/L	7470	< 0.00020	0.00020	0.00020	U	1	02-JUL-96	38450	L7305-123

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: C6-R36	Date Collected: 21-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CADMIUM, TOTAL	mg/l	6010	< 0.0050	0.0050	0.0050	U	1	29-JUN-96	38448	L7305-125
CHROMIUM, TOTAL	mg/l	6010	< 0.0060	0.0060	0.010	U	1	28-JUN-96	38448	L7305-125
NICKEL, TOTAL	mg/l	6010	0.022	0.013	0.040	B	1	28-JUN-96	38448	L7305-125
VANADIUM, TOTAL	mg/l	6010	< 0.0070	0.0070	0.050	U	1	28-JUN-96	38448	L7305-125
ARSENIC, TOTAL	mg/l	7060	0.0059	0.0030	0.010	B	1	28-JUN-96	38449	L7305-125
LEAD, TOTAL	mg/l	7421	< 0.010	0.010	0.015	U	5	28-JUN-96	38449	L7305-125
MERCURY, TOTAL	mg/L	7470	< 0.00020	0.00020	0.00020	U	1	02-JUL-96	38450	L7305-125

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: D6-R34	Date Collected: 21-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CADMIUM, TOTAL	mg/l	6010	< 0.0050	0.0050	0.0050	U	1	29-JUN-96	38448	L7305-126
CHROMIUM, TOTAL	mg/l	6010	< 0.0060	0.0060	0.010	U	1	28-JUN-96	38448	L7305-126
NICKEL, TOTAL	mg/l	6010	< 0.013	0.013	0.040	U	1	28-JUN-96	38448	L7305-126
VANADIUM, TOTAL	mg/l	6010	< 0.0070	0.0070	0.050	U	1	28-JUN-96	38448	L7305-126
ARSENIC, TOTAL	mg/l	7060	< 0.0030	0.0030	0.010	U	1	28-JUN-96	38449	L7305-126
LEAD, TOTAL	mg/l	7421	< 0.010	0.010	0.015	U	5	28-JUN-96	38449	L7305-126
MERCURY, TOTAL	mg/L	7470	< 0.00020	0.00020	0.00020	U	1	02-JUL-96	38450	L7305-126

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: B8-D1	Date Collected: 21-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CADMIUM, TOTAL	mg/l	6010	< 0.0050	0.0050	0.0050	U	1	29-JUN-96	38448	L7305-127
CHROMIUM, TOTAL	mg/l	6010	< 0.0060	0.0060	0.010	U	1	28-JUN-96	38448	L7305-127
NICKEL, TOTAL	mg/l	6010	0.016	0.013	0.040	B	1	28-JUN-96	38448	L7305-127
VANADIUM, TOTAL	mg/l	6010	< 0.0070	0.0070	0.050	U	1	28-JUN-96	38448	L7305-127
ARSENIC, TOTAL	mg/l	7060	0.0050	0.0030	0.010	B	1	28-JUN-96	38449	L7305-127
LEAD, TOTAL	mg/l	7421	< 0.010	0.010	0.015	U	5	28-JUN-96	38449	L7305-127
MERCURY, TOTAL	mg/L	7470	< 0.00020	0.00020	0.00020	U	1	02-JUL-96	38450	L7305-127

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: D7-34	Date Collected: 21-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CADMIUM, TOTAL	mg/l	6010	< 0.0050	0.0050	0.0050	U	1	30-JUN-96	38448	L7305-128
CHROMIUM, TOTAL	mg/l	6010	0.33	0.0060	0.010		1	28-JUN-96	38448	L7305-128
NICKEL, TOTAL	mg/l	6010	0.24	0.013	0.040		1	28-JUN-96	38448	L7305-128
VANADIUM, TOTAL	mg/l	6010	0.24	0.0070	0.050		1	28-JUN-96	38448	L7305-128
ARSENIC, TOTAL	mg/l	7060	0.16	0.015	0.050		5	28-JUN-96	38449	L7305-128
LEAD, TOTAL	mg/l	7421	0.32	0.010	0.015		5	28-JUN-96	38449	L7305-128
MERCURY, TOTAL	mg/L	7470	0.0026	0.00020	0.00020		1	02-JUL-96	38450	L7305-128

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: D7-15	Date Collected: 21-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CADMIUM, TOTAL	mg/l	6010	< 0.0050	0.0050	0.0050	U	1	30-JUN-96	38448	L7305-129
CHROMIUM, TOTAL	mg/l	6010	< 0.0060	0.0060	0.010	U	1	28-JUN-96	38448	L7305-129
NICKEL, TOTAL	mg/l	6010	< 0.013	0.013	0.040	U	1	28-JUN-96	38448	L7305-129
VANADIUM, TOTAL	mg/l	6010	< 0.0070	0.0070	0.050	U	1	28-JUN-96	38448	L7305-129
ARSENIC, TOTAL	mg/l	7060	< 0.0030	0.0030	0.010	U	1	28-JUN-96	38449	L7305-129
LEAD, TOTAL	mg/l	7421	< 0.010	0.010	0.015	U	5	28-JUN-96	38449	L7305-129
MERCURY, TOTAL	mg/L	7470	< 0.00020	0.00020	0.00020	U	1	02-JUL-96	38450	L7305-129

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: I3-67	Date Collected: 21-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CADMIUM, TOTAL	mg/l	6010	< 0.0050	0.0050	0.0050	U	1	30-JUN-96	38448	L7305-130
CHROMIUM, TOTAL	mg/l	6010	< 0.0060	0.0060	0.010	U	1	28-JUN-96	38448	L7305-130
NICKEL, TOTAL	mg/l	6010	0.039	0.013	0.040	B	1	28-JUN-96	38448	L7305-130
VANADIUM, TOTAL	mg/l	6010	0.0075	0.0070	0.050	B	1	28-JUN-96	38448	L7305-130
ARSENIC, TOTAL	mg/l	7060	< 0.0030	0.0030	0.010	U	1	28-JUN-96	38449	L7305-130
LEAD, TOTAL	mg/l	7421	< 0.010	0.010	0.015	U	5	28-JUN-96	38449	L7305-130
MERCURY, TOTAL	mg/L	7470	< 0.00020	0.00020	0.00020	U	1	02-JUL-96	38450	L7305-130

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: B4-61	Date Collected: 21-JUN-96
Matrix: Water	Date Received: 24-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CADMIUM, TOTAL	mg/l	6010	< 0.0050	0.0050	0.0050	U	1	30-JUN-96	38448	L7305-131
CHROMIUM, TOTAL	mg/l	6010	0.033	0.0060	0.010		1	28-JUN-96	38448	L7305-131
NICKEL, TOTAL	mg/l	6010	0.014	0.013	0.040	B	1	28-JUN-96	38448	L7305-131
VANADIUM, TOTAL	mg/l	6010	0.012	0.0070	0.050	B	1	28-JUN-96	38448	L7305-131
ARSENIC, TOTAL	mg/l	7060	0.032	0.0030	0.010		1	28-JUN-96	38449	L7305-131
LEAD, TOTAL	mg/l	7421	< 0.010	0.010	0.015	U	5	28-JUN-96	38449	L7305-131
MERCURY, TOTAL	mg/L	7470	< 0.00020	0.00020	0.00020	U	1	02-JUL-96	38450	L7305-131

LOCKHEED ANALYTICAL SERVICES

METALS RESULTS

QC Data Summary For Reagent Blank Analysis

Constituent	Units	MDL	RDL	LAS Batch ID	Date Analyzed	Reagent Blank Result	Data Qualifier
CADMIUM, TOTAL	mg/l	.005	.005	38448	29-JUN-96	< .005	
CHROMIUM, TOTAL	mg/l	.006	.01	38448	28-JUN-96	< .006	
NICKEL, TOTAL	mg/l	.013	.04	38448	28-JUN-96	< .013	
VANADIUM, TOTAL	mg/l	.007	.05	38448	28-JUN-96	< .007	

LOCKHEED ANALYTICAL SERVICES

METALS RESULTS

QC Data Summary For Reagent Blank Analysis

Constituent	Units	MDL	RDL	LAS Batch ID	Date Analyzed	Reagent Blank Result	Data Qualifier
ARSENIC, TOTAL	mg/l	.003	.01	38449	28-JUN-96	< .003	
LEAD, TOTAL	mg/l	.002	.003	38449	28-JUN-96	< .002	

LOCKHEED ANALYTICAL SERVICES

METALS RESULTS

QC Data Summary For Reagent Blank Analysis

Constituent	Units	MDL	RDL	LAS Batch ID	Date Analyzed	Reagent Blank Result	Data Qualifier
MERCURY, TOTAL	mg/L	.0002	.0002	38450	02-JUL-96	< .0002	

LOCKHEED ANALYTICAL SERVICES

METALS RESULTS

QC Data Summary For Duplicate Sample Analysis

Client Sample ID C6-R04 (DUP)

Constituent	Units	LAS Batch ID	LAS Sample ID	Date Analyzed	Sample Result	Duplicate Result	Relative Percent Difference	Control Limit	Data Qualifier
CADMIUM, TOTAL	mg/l	38448	L7305-123	29-JUN-96	< 0.0050	< 0.0050	b		
CHROMIUM, TOTAL	mg/l	38448	L7305-123	28-JUN-96	< 0.0060	< 0.0060	b		
NICKEL, TOTAL	mg/l	38448	L7305-123	28-JUN-96	< 0.013	0.02237	b		
VANADIUM, TOTAL	mg/l	38448	L7305-123	28-JUN-96	< 0.0070	< 0.0070	b		
ARSENIC, TOTAL	mg/l	38449	L7305-123	28-JUN-96	< 0.0030	0.007000	b		
LEAD, TOTAL	mg/l	38449	L7305-123	28-JUN-96	< 0.010	< 0.010	b		
MERCURY, TOTAL	mg/L	38450	L7305-123	02-JUL-96	< 0.00020	< 0.00020	b		

LOCKHEED ANALYTICAL SERVICES

METALS RESULTS

QC Data Summary For Matrix Spike Sample Analysis

Client Sample ID C6-R04 (MS)

Constituent	Units	LAS Batch ID	LAS Sample ID	Date Analyzed	Matrix Spike Result	Sample Result	Spike Added	(%) Recovery	Data Qualifier
CADMIUM, TOTAL	mg/l	38448	L7305-123	29-JUN-96	0.04638	< 0.0050	0.05000	93	
CHROMIUM, TOTAL	mg/l	38448	L7305-123	28-JUN-96	0.1839	< 0.0060	0.2000	92	
NICKEL, TOTAL	mg/l	38448	L7305-123	28-JUN-96	0.4520	< 0.013	0.5000	90	
VANADIUM, TOTAL	mg/l	38448	L7305-123	28-JUN-96	0.4716	< 0.0070	0.5000	94	
ARSENIC, TOTAL	mg/l	38449	L7305-123	28-JUN-96	0.5240	< 0.0030	0.5000	105	
LEAD, TOTAL	mg/l	38449	L7305-123	28-JUN-96	0.5090	< 0.010	0.5000	102	
MERCURY, TOTAL	mg/L	38450	L7305-123	02-JUL-96	0.001037	< 0.00020	0.001000	104	

LOCKHEED ANALYTICAL SERVICES

METALS RESULTS

QC Data Summary For Laboratory Control Sample Analysis

Sample: 38448LCS

Constituent	Units	LAS Batch ID	Date Analyzed	LCS True Value	LCS Result	(%) Recovery
CADMIUM, TOTAL	mg/l	38448	29-JUN-96	0.05000	0.05100	102
CHROMIUM, TOTAL	mg/l	38448	28-JUN-96	0.2000	0.1965	98.3
NICKEL, TOTAL	mg/l	38448	28-JUN-96	0.5000	0.4796	95.9
VANADIUM, TOTAL	mg/l	38448	28-JUN-96	0.5000	0.4936	98.7

LOCKHEED ANALYTICAL SERVICES

METALS RESULTS

QC Data Summary For Laboratory Control Sample Analysis

Sample: 38449LCS

Constituent	Units	LAS Batch ID	Date Analyzed	LCS True Value	LCS Result	(%) Recovery
ARSENIC, TOTAL	mg/l	38449	28-JUN-96	0.5000	0.4960	99.2
LEAD, TOTAL	mg/l	38449	28-JUN-96	0.5000	0.5230	104.6

LOCKHEED ANALYTICAL SERVICES

METALS RESULTS

QC Data Summary For Laboratory Control Sample Analysis

Sample: 38450LCS

Constituent	Units	LAS Batch ID	Date Analyzed	LCS True Value	LCS Result	(%) Recovery
MERCURY, TOTAL	mg/L	38450	02-JUL-96	0.001000	0.001046	104.6

EPA METHOD 8260 (Volatile Organics)

SAMPLE RESULTS FORMS AND QC SUMMARIES

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
260 VOLATILES

Client Sample ID:	C6-56	LAL Sample ID:	L7305-1
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	28-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	110%	84-122
Toluene-d8	111%	87-117
Bromofluorobenzene	109%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Benzene	71-43-2	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
60 VOLATILES

Client Sample ID:	C6-58	LAL Sample ID:	L7305-4
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	28-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	108%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	110%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Benzene	71-43-2	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
0 VOLATILES

Client Sample ID:	A3-62	LAL Sample ID:	L7305-7
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	28-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	109%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	111%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(S)
Benzene	71-43-2	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
'0 VOLATILES

Client Sample ID:	C6-R37	LAL Sample ID:	L7305-10
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	28-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	109%	84-122
Toluene-d8	109%	87-117
Bromofluorobenzene	111%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Benzene	71-43-2	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
50 VOLATILES

Client Sample ID:	C2-64	LAL Sample ID:	L7305-13
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	108%	84-122
Toluene-d8	107%	87-117
Bromofluorobenzene	108%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	<5.0	5.0	
Vinyl Chloride	75-01-4	<5.0	5.0	
Bromomethane	74-83-9	<5.0	5.0	
Chloroethane	75-00-3	<5.0	5.0	
Trichlorofluoromethane	75-69-4	<5.0	5.0	
Acetone	67-64-1	<10.	10.	
1,1-Dichloroethene	75-35-4	2.3	5.0	J
Carbon Disulfide	75-15-0	<5.0	5.0	
Methylene Chloride	75-09-2	<5.0	5.0	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Vinyl Acetate	108-05-4	<10.	10.	
1,1-Dichloroethane	75-34-3	2.4	5.0	J
2-Butanone	78-93-3	<10.	10.	
cis-1,2-Dichloroethene	156-59-2	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
2-Chloroethylvinylether	110-75-8	<20.	20.	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
2-Hexanone	591-78-6	<10.	10.	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Tetrachloroethene	127-18-4	<5.0	5.0	
Dibromochloromethane	124-48-1	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
50 VOLATILES

Client Sample ID:	C7-54	LAL Sample ID:	L7305-16
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	109%	84-122
Toluene-d8	108%	87-117
Bromofluorobenzene	110%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	<5.0	5.0	
Vinyl Chloride	75-01-4	<5.0	5.0	
Bromomethane	74-83-9	<5.0	5.0	
Chloroethane	75-00-3	<5.0	5.0	
Trichlorofluoromethane	75-69-4	<5.0	5.0	
Acetone	67-64-1	4.1	10.	JB
1,1-Dichloroethene	75-35-4	<5.0	5.0	
Carbon Disulfide	75-15-0	<5.0	5.0	
Methylene Chloride	75-09-2	<5.0	5.0	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Vinyl Acetate	108-05-4	<10.	10.	
1,1-Dichloroethane	75-34-3	<5.0	5.0	
2-Butanone	78-93-3	<10.	10.	
cis-1,2-Dichloroethene	156-59-2	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
2-Chloroethylvinylether	110-75-8	<20.	20.	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
2-Hexanone	591-78-6	<10.	10.	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Tetrachloroethene	127-18-4	<5.0	5.0	
Dibromochloromethane	124-48-1	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
:0 VOLATILES

Client Sample ID:	D8-50	LAL Sample ID:	L7305-19
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	109%	84-122
Toluene-d8	111%	87-117
Bromofluorobenzene	111%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	<5.0	5.0	
Vinyl Chloride	75-01-4	<5.0	5.0	
Bromomethane	74-83-9	<5.0	5.0	
Chloroethane	75-00-3	<5.0	5.0	
Trichlorofluoromethane	75-69-4	<5.0	5.0	
Acetone	67-64-1	6.1	10.	JB
1,1-Dichloroethene	75-35-4	<5.0	5.0	
Carbon Disulfide	75-15-0	1.5	5.0	J
Methylene Chloride	75-09-2	<5.0	5.0	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Vinyl Acetate	108-05-4	<10.	10.	
1,1-Dichloroethane	75-34-3	<5.0	5.0	
2-Butanone	78-93-3	<10.	10.	
cis-1,2-Dichloroethene	156-59-2	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
2-Chloroethylvinylether	110-75-8	<20.	20.	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
Toluene	108-88-3	12.	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
2-Hexanone	591-78-6	<10.	10.	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Tetrachloroethene	127-18-4	<5.0	5.0	
Dibromochloromethane	124-48-1	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	9.7	5.0	
m,p-Xylene	136777-61-2	94.	5.0	
o-Xylene	95-47-6	37.	5.0	
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
50 VOLATILES

Client Sample ID:	D8-48	LAL Sample ID:	L7305-22
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	108%	84-122
Toluene-d8	109%	87-117
Bromofluorobenzene	110%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	<5.0	5.0	
Vinyl Chloride	75-01-4	<5.0	5.0	
Bromomethane	74-83-9	<5.0	5.0	
Chloroethane	75-00-3	<5.0	5.0	
Trichlorofluoromethane	75-69-4	<5.0	5.0	
Acetone	67-64-1	<10.	10.	
1,1-Dichloroethene	75-35-4	<5.0	5.0	
Carbon Disulfide	75-15-0	<5.0	5.0	
Methylene Chloride	75-09-2	<5.0	5.0	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Vinyl Acetate	108-05-4	<10.	10.	
1,1-Dichloroethane	75-34-3	<5.0	5.0	
2-Butanone	78-93-3	<10.	10.	
cis-1,2-Dichloroethene	156-59-2	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
2-Chloroethylvinylether	110-75-8	<20.	20.	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
2-Hexanone	591-78-6	<10.	10.	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Tetrachloroethene	127-18-4	<5.0	5.0	
Dibromochloromethane	124-48-1	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
50 VOLATILES

Client Sample ID:	D7-51	LAL Sample ID:	L7305-25
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	28-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	108%	84-122
Toluene-d8	109%	87-117
Bromofluorobenzene	109%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Benzene	71-43-2	<5.0	5.0	
Toluene	108-88-3	1.4	5.0	J
Ethylbenzene	100-41-4	4.9	5.0	J
m,p-Xylene	136777-61-2	3.7	5.0	J
o-Xylene	95-47-6	14.	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
50 VOLATILES

Client Sample ID:	D7-33	LAL Sample ID:	L7305-28
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	28-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	110%	84-122
Toluene-d8	111%	87-117
Bromofluorobenzene	111%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Benzene	71-43-2	<5.0	5.0	
Toluene	108-88-3	6.2	5.0	
Ethylbenzene	100-41-4	9.5	5.0	
m,p-Xylene	136777-61-2	140	5.0	
o-Xylene	95-47-6	19.	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
SW846 8260 VOLATILES

Client Sample ID:	C6-R04	LAL Sample ID:	L7305-31
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	107%	84-122
Toluene-d8	109%	87-117
Bromofluorobenzene	109%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	<5.0	5.0	
Vinyl Chloride	75-01-4	<5.0	5.0	
Bromomethane	74-83-9	<5.0	5.0	
Chloroethane	75-00-3	<5.0	5.0	
Trichlorofluoromethane	75-69-4	<5.0	5.0	
Acetone	67-64-1	<10.	10.	
1,1-Dichloroethene	75-35-4	<5.0	5.0	
Carbon Disulfide	75-15-0	<5.0	5.0	
Methylene Chloride	75-09-2	<5.0	5.0	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Vinyl Acetate	108-05-4	<10.	10.	
1,1-Dichloroethane	75-34-3	<5.0	5.0	
2-Butanone	78-93-3	<10.	10.	
cis-1,2-Dichloroethene	156-59-2	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
2-Chloroethylvinylether	110-75-8	<20.	20.	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
2-Hexanone	591-78-6	<10.	10.	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Tetrachloroethene	127-18-4	<5.0	5.0	
Dibromochloromethane	124-48-1	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
60 VOLATILES

Client Sample ID:	C6-R36	LAL Sample ID:	L7305-36
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	28-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	109%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	110%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Benzene	71-43-2	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
`60 VOLATILES

Client Sample ID:	D6-R34	LAL Sample ID:	L7305-39
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	108%	84-122
Toluene-d8	108%	87-117
Bromofluorobenzene	108%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	<5.0	5.0	
Vinyl Chloride	75-01-4	<5.0	5.0	
Bromomethane	74-83-9	<5.0	5.0	
Chloroethane	75-00-3	<5.0	5.0	
Trichlorofluoromethane	75-69-4	<5.0	5.0	
Acetone	67-64-1	4.8	10.	JB
1,1-Dichloroethene	75-35-4	<5.0	5.0	
Carbon Disulfide	75-15-0	2.2	5.0	J
Methylene Chloride	75-09-2	<5.0	5.0	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Vinyl Acetate	108-05-4	<10.	10.	
1,1-Dichloroethane	75-34-3	<5.0	5.0	
2-Butanone	78-93-3	<10.	10.	
cis-1,2-Dichloroethene	156-59-2	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
2-Chloroethylvinylether	110-75-8	<20.	20.	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
2-Hexanone	591-78-6	<10.	10.	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Tetrachloroethene	127-18-4	<5.0	5.0	
Dibromochloromethane	124-48-1	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	5.8	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
60 VOLATILES

Client Sample ID:	B8-D1	LAL Sample ID:	L7305-42
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	28-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	108%	84-122
Toluene-d8	108%	87-117
Bromofluorobenzene	109%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Benzene	71-43-2	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
50 VOLATILES

Client Sample ID:	TBS-002	LAL Sample ID:	L7305-45
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	108%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	111%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	<5.0	5.0	
Vinyl Chloride	75-01-4	<5.0	5.0	
Bromomethane	74-83-9	<5.0	5.0	
Chloroethane	75-00-3	<5.0	5.0	
Trichlorofluoromethane	75-69-4	<5.0	5.0	
Acetone	67-64-1	<10.	10.	
1,1-Dichloroethene	75-35-4	<5.0	5.0	
Carbon Disulfide	75-15-0	<5.0	5.0	
Methylene Chloride	75-09-2	<5.0	5.0	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Vinyl Acetate	108-05-4	<10.	10.	
1,1-Dichloroethane	75-34-3	<5.0	5.0	
2-Butanone	78-93-3	<10.	10.	
cis-1,2-Dichloroethene	156-59-2	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
2-Chloroethylvinylether	110-75-8	<20.	20.	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
2-Hexanone	591-78-6	<10.	10.	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Tetrachloroethene	127-18-4	<5.0	5.0	
Dibromochloromethane	124-48-1	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
'0 VOLATILES

Client Sample ID:	D7-34	LAL Sample ID:	L7305-48
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	30-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	063096-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	100%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	109%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	<5.0	5.0	
Vinyl Chloride	75-01-4	<5.0	5.0	
Bromomethane	74-83-9	<5.0	5.0	
Chloroethane	75-00-3	<5.0	5.0	
Trichlorofluoromethane	75-69-4	<5.0	5.0	
Acetone	67-64-1	<10.	10.	
1,1-Dichloroethene	75-35-4	<5.0	5.0	
Carbon Disulfide	75-15-0	<5.0	5.0	
Methylene Chloride	75-09-2	<5.0	5.0	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Vinyl Acetate	108-05-4	<10.	10.	
1,1-Dichloroethane	75-34-3	<5.0	5.0	
2-Butanone	78-93-3	<10.	10.	
cis-1,2-Dichloroethene	156-59-2	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
2-Chloroethylvinylether	110-75-8	<20.	20.	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
2-Hexanone	591-78-6	<10.	10.	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Tetrachloroethene	127-18-4	<5.0	5.0	
Dibromochloromethane	124-48-1	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
10 VOLATILES

Client Sample ID:	D7-15	LAL Sample ID:	L7305-51
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	110%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	111%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Benzene	71-43-2	3.2	5.0	J
Toluene	108-88-3	55.	5.0	
Ethylbenzene	100-41-4	54.	5.0	
m,p-Xylene	136777-61-2	180	5.0	
o-Xylene	95-47-6	120	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
50 VOLATILES

Client Sample ID:	I3-67	LAL Sample ID:	L7305-54
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	109%	84-122
Toluene-d8	109%	87-117
Bromofluorobenzene	110%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	<5.0	5.0	
Vinyl Chloride	75-01-4	<5.0	5.0	
Bromomethane	74-83-9	<5.0	5.0	
Chloroethane	75-00-3	<5.0	5.0	
Trichlorofluoromethane	75-69-4	<5.0	5.0	
Acetone	67-64-1	<10.	10.	
1,1-Dichloroethene	75-35-4	<5.0	5.0	
Carbon Disulfide	75-15-0	<5.0	5.0	
Methylene Chloride	75-09-2	<5.0	5.0	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Vinyl Acetate	108-05-4	<10.	10.	
1,1-Dichloroethane	75-34-3	<5.0	5.0	
2-Butanone	78-93-3	<10.	10.	
cis-1,2-Dichloroethene	156-59-2	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
2-Chloroethylvinylether	110-75-8	<20.	20.	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
2-Hexanone	591-78-6	<10.	10.	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Tetrachloroethene	127-18-4	<5.0	5.0	
Dibromochloromethane	124-48-1	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

'LATILE ORGANICS BY GC/MS
;0 VOLATILES

Client Sample ID:	TBS-003	LAL Sample ID:	L7305-57
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
Matrix: --	Water	Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	108%	84-122
Toluene-d8	108%	87-117
Bromofluorobenzene	110%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	<5.0	5.0	
Vinyl Chloride	75-01-4	<5.0	5.0	
Bromomethane	74-83-9	<5.0	5.0	
Chloroethane	75-00-3	<5.0	5.0	
Trichlorofluoromethane	75-69-4	<5.0	5.0	
Acetone	67-64-1	5.3	10.	JB
1,1-Dichloroethene	75-35-4	<5.0	5.0	
Carbon Disulfide	75-15-0	<5.0	5.0	
Methylene Chloride	75-09-2	<5.0	5.0	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Vinyl Acetate	108-05-4	<10.	10.	
1,1-Dichloroethane	75-34-3	<5.0	5.0	
2-Butanone	78-93-3	<10.	10.	
cis-1,2-Dichloroethene	156-59-2	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
2-Chloroethylvinylether	110-75-8	<20.	20.	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
2-Hexanone	591-78-6	<10.	10.	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Tetrachloroethene	127-18-4	<5.0	5.0	
Dibromochloromethane	124-48-1	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
60 VOLATILES

Client Sample ID:	TBS-001	LAL Sample ID:	L7305-60
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	110%	84-122
Toluene-d8	109%	87-117
Bromofluorobenzene	110%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	<5.0	5.0	
Vinyl Chloride	75-01-4	<5.0	5.0	
Bromomethane	74-83-9	<5.0	5.0	
Chloroethane	75-00-3	<5.0	5.0	
Trichlorofluoromethane	75-69-4	<5.0	5.0	
Acetone	67-64-1	4.5	10.	JB
1,1-Dichloroethene	75-35-4	<5.0	5.0	
Carbon Disulfide	75-15-0	<5.0	5.0	
Methylene Chloride	75-09-2	<5.0	5.0	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Vinyl Acetate	108-05-4	<10.	10.	
1,1-Dichloroethane	75-34-3	<5.0	5.0	
2-Butanone	78-93-3	<10.	10.	
cis-1,2-Dichloroethene	156-59-2	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
2-Chloroethylvinylether	110-75-8	<20.	20.	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
2-Hexanone	591-78-6	<10.	10.	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Tetrachloroethene	127-18-4	<5.0	5.0	
Dibromochloromethane	124-48-1	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
50 VOLATILES

Client Sample ID:	B4-61	LAL Sample ID:	L7305-63
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	109%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	111%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Benzene	71-43-2	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Method Blank	LAL Sample ID:	38532MB
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	28-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	107%	84-122
Toluene-d8	111%	87-117
Bromofluorobenzene	110%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Benzene	71-43-2	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Method Blank	LAL Sample ID:	38559MB
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	108%	84-122
Toluene-d8	111%	87-117
Bromofluorobenzene	112%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	<5.0	5.0	
Vinyl Chloride	75-01-4	<5.0	5.0	
Bromomethane	74-83-9	<5.0	5.0	
Chloroethane	75-00-3	<5.0	5.0	
Trichlorofluoromethane	75-69-4	<5.0	5.0	
Acetone	67-64-1	4.1	10.	J
1,1-Dichloroethene	75-35-4	<5.0	5.0	
Carbon Disulfide	75-15-0	<5.0	5.0	
Methylene Chloride	75-09-2	<5.0	5.0	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Vinyl Acetate	108-05-4	<10.	10.	
1,1-Dichloroethane	75-34-3	<5.0	5.0	
2-Butanone	78-93-3	<10.	10.	
cis-1,2-Dichloroethene	156-59-2	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
2-Chloroethylvinylether	110-75-8	<20.	20.	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
2-Hexanone	591-78-6	<10.	10.	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Tetrachloroethene	127-18-4	<5.0	5.0	
Dibromochloromethane	124-48-1	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Method Blank	LAL Sample ID:	38561MB
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	30-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	063096-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	107%	84-122
Toluene-d8	109%	87-117
Bromofluorobenzene	111%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	<5.0	5.0	
Vinyl Chloride	75-01-4	<5.0	5.0	
Bromomethane	74-83-9	<5.0	5.0	
Chloroethane	75-00-3	<5.0	5.0	
Trichlorofluoromethane	75-69-4	<5.0	5.0	
Acetone	67-64-1	<10.	10.	
1,1-Dichloroethene	75-35-4	<5.0	5.0	
Carbon Disulfide	75-15-0	<5.0	5.0	
Methylene Chloride	75-09-2	<5.0	5.0	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Vinyl Acetate	108-05-4	<10.	10.	
1,1-Dichloroethane	75-34-3	<5.0	5.0	
2-Butanone	78-93-3	<10.	10.	
cis-1,2-Dichloroethene	156-59-2	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
2-Chloroethylvinylether	110-75-8	<20.	20.	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
2-Hexanone	591-78-6	<10.	10.	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Tetrachloroethene	127-18-4	<5.0	5.0	
Dibromochloromethane	124-48-1	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	C6-58	LAL Sample ID:	38532MS
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	28-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	107%	84-122
Toluene-d8	111%	87-117
Bromofluorobenzene	111%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	40.	5.0	
Vinyl Chloride	75-01-4	42.	5.0	
Bromomethane	74-83-9	91.	5.0	
Chloroethane	75-00-3	69.	5.0	
Trichlorofluoromethane	75-69-4	43.	5.0	
Acetone	67-64-1	42.	10.	
1,1-Dichloroethene	75-35-4	40.	5.0	
Carbon Disulfide	75-15-0	41.	5.0	
Methylene Chloride	75-09-2	41.	5.0	
trans-1,2-Dichloroethene	156-60-5	41.	5.0	
Vinyl Acetate	108-05-4	46.	10.	
1,1-Dichloroethane	75-34-3	52.	5.0	
2-Butanone	78-93-3	44.	10.	
cis-1,2-Dichloroethene	156-59-2	42.	5.0	
Chloroform	67-66-3	41.	5.0	
1,1,1-Trichloroethane	71-55-6	41.	5.0	
Carbon tetrachloride	56-23-5	44.	5.0	
1,2-Dichloroethane	107-06-2	44.	5.0	
Benzene	71-43-2	44.	5.0	
Trichloroethene	79-01-6	43.	5.0	
1,2-Dichloropropane	78-87-5	43.	5.0	
Bromodichloromethane	75-27-4	44.	5.0	
2-Chloroethylvinylether	110-75-8	170	20.	
4-Methyl-2-Pentanone	108-10-1	49.	10.	
cis-1,3-Dichloropropene	10061-01-5	43.	5.0	
Toluene	108-88-3	45.	5.0	
trans-1,3-Dichloropropene	10061-02-6	43.	5.0	
2-Hexanone	591-78-6	51.	10.	
1,1,2-Trichloroethane	79-00-5	45.	5.0	
Tetrachloroethene	127-18-4	43.	5.0	
Dibromochloromethane	124-48-1	43.	5.0	
Chlorobenzene	108-90-7	44.	5.0	
Ethylbenzene	100-41-4	44.	5.0	
m,p-Xylene	136777-61-2	93.	5.0	
o-Xylene	95-47-6	46.	5.0	
Styrene	100-42-5	45.	5.0	
Bromoform	75-25-2	45.	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	48.	5.0	
1,3-Dichlorobenzene	541-73-1	44.	5.0	
1,4-Dichlorobenzene	106-46-7	44.	5.0	
1,2-Dichlorobenzene	95-50-1	44.	5.0	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	C6-R04	LAL Sample ID:	38559MS
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	107%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	110%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(S)
Chloromethane	74-87-3	39.	5.0	
Vinyl Chloride	75-01-4	41.	5.0	
Bromomethane	74-83-9	71.	5.0	
Chloroethane	75-00-3	71.	5.0	
Trichlorofluoromethane	75-69-4	45.	5.0	
Acetone	67-64-1	42.	10.	B
1,1-Dichloroethene	75-35-4	41.	5.0	
Carbon Disulfide	75-15-0	40.	5.0	
Methylene Chloride	75-09-2	40.	5.0	
trans-1,2-Dichloroethene	156-60-5	41.	5.0	
Vinyl Acetate	108-05-4	44.	10.	
1,1-Dichloroethane	75-34-3	41.	5.0	
2-Butanone	78-93-3	41.	10.	
cis-1,2-Dichloroethene	156-59-2	42.	5.0	
Chloroform	67-66-3	42.	5.0	
1,1,1-Trichloroethane	71-55-6	43.	5.0	
Carbon tetrachloride	56-23-5	45.	5.0	
1,2-Dichloroethane	107-06-2	43.	5.0	
Benzene	71-43-2	44.	5.0	
Trichloroethene	79-01-6	43.	5.0	
1,2-Dichloropropane	78-87-5	43.	5.0	
Bromodichloromethane	75-27-4	44.	5.0	
2-Chloroethylvinylether	110-75-8	170	20.	
4-Methyl-2-Pentanone	108-10-1	45.	10.	
cis-1,3-Dichloropropene	10061-01-5	42.	5.0	
Toluene	108-88-3	45.	5.0	
trans-1,3-Dichloropropene	10061-02-6	43.	5.0	
2-Hexanone	591-78-6	48.	10.	
1,1,2-Trichloroethane	79-00-5	44.	5.0	
Tetrachloroethene	127-18-4	45.	5.0	
Dibromochloromethane	124-48-1	43.	5.0	
Chlorobenzene	108-90-7	44.	5.0	
Ethylbenzene	100-41-4	45.	5.0	
m,p-Xylene	136777-61-2	95.	5.0	
o-Xylene	95-47-6	47.	5.0	
Styrene	100-42-5	47.	5.0	
Bromoform	75-25-2	44.	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	47.	5.0	
1,3-Dichlorobenzene	541-73-1	45.	5.0	
1,4-Dichlorobenzene	106-46-7	44.	5.0	
1,2-Dichlorobenzene	95-50-1	45.	5.0	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	C6-58	LAL Sample ID:	38532MSD
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	28-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	108%	84-122
Toluene-d8	111%	87-117
Bromofluorobenzene	110%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	41.	5.0	
Vinyl Chloride	75-01-4	43.	5.0	
Bromomethane	74-83-9	64.	5.0	
Chloroethane	75-00-3	72.	5.0	
Trichlorofluoromethane	75-69-4	43.	5.0	
Acetone	67-64-1	47.	10.	
1,1-Dichloroethene	75-35-4	41.	5.0	
Carbon Disulfide	75-15-0	42.	5.0	
Methylene Chloride	75-09-2	41.	5.0	
trans-1,2-Dichloroethene	156-60-5	41.	5.0	
Vinyl Acetate	108-05-4	47.	10.	
1,1-Dichloroethane	75-34-3	53.	5.0	
2-Butanone	78-93-3	46.	10.	
cis-1,2-Dichloroethene	156-59-2	43.	5.0	
Chloroform	67-66-3	43.	5.0	
1,1,1-Trichloroethane	71-55-6	43.	5.0	
Carbon tetrachloride	56-23-5	44.	5.0	
1,2-Dichloroethane	107-06-2	45.	5.0	
Benzene	71-43-2	45.	5.0	
Trichloroethene	79-01-6	44.	5.0	
1,2-Dichloropropane	78-87-5	44.	5.0	
Bromodichloromethane	75-27-4	45.	5.0	
2-Chloroethylvinylether	110-75-8	170	20.	
4-Methyl-2-Pentanone	108-10-1	50.	10.	
cis-1,3-Dichloropropene	10061-01-5	43.	5.0	
Toluene	108-88-3	46.	5.0	
trans-1,3-Dichloropropene	10061-02-6	44.	5.0	
2-Hexanone	591-78-6	54.	10.	
1,1,2-Trichloroethane	79-00-5	46.	5.0	
Tetrachloroethene	127-18-4	44.	5.0	
Dibromochloromethane	124-48-1	44.	5.0	
Chlorobenzene	108-90-7	45.	5.0	
Ethylbenzene	100-41-4	45.	5.0	
m,p-Xylene	136777-61-2	95.	5.0	
o-Xylene	95-47-6	47.	5.0	
Styrene	100-42-5	46.	5.0	
Bromoform	75-25-2	47.	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	51.	5.0	
1,3-Dichlorobenzene	541-73-1	45.	5.0	
1,4-Dichlorobenzene	106-46-7	45.	5.0	
1,2-Dichlorobenzene	95-50-1	46.	5.0	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT

VOLATILE ORGANICS BY GC/MS

Client Sample ID:	C6-R04	LAL Sample ID:	38559MSD
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	107%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	110%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	42.	5.0	
Vinyl Chloride	75-01-4	44.	5.0	
Bromomethane	74-83-9	85.	5.0	
Chloroethane	75-00-3	74.	5.0	
Trichlorofluoromethane	75-69-4	48.	5.0	
Acetone	67-64-1	45.	10.	B
1,1-Dichloroethene	75-35-4	43.	5.0	
Carbon Disulfide	75-15-0	43.	5.0	
Methylene Chloride	75-09-2	43.	5.0	
trans-1,2-Dichloroethene	156-60-5	43.	5.0	
Vinyl Acetate	108-05-4	47.	10.	
1,1-Dichloroethane	75-34-3	44.	5.0	
2-Butanone	78-93-3	45.	10.	
cis-1,2-Dichloroethene	156-59-2	45.	5.0	
Chloroform	67-66-3	44.	5.0	
1,1,1-Trichloroethane	71-55-6	45.	5.0	
Carbon tetrachloride	56-23-5	48.	5.0	
1,2-Dichloroethane	107-06-2	47.	5.0	
Benzene	71-43-2	47.	5.0	
Trichloroethene	79-01-6	46.	5.0	
1,2-Dichloropropane	78-87-5	45.	5.0	
Bromodichloromethane	75-27-4	47.	5.0	
2-Chloroethylvinylether	110-75-8	180	20.	
4-Methyl-2-Pentanone	108-10-1	50.	10.	
cis-1,3-Dichloropropene	10061-01-5	45.	5.0	
Toluene	108-88-3	48.	5.0	
trans-1,3-Dichloropropene	10061-02-6	45.	5.0	
2-Hexanone	591-78-6	53.	10.	
1,1,2-Trichloroethane	79-00-5	48.	5.0	
Tetrachloroethene	127-18-4	47.	5.0	
Dibromochloromethane	124-48-1	46.	5.0	
Chlorobenzene	108-90-7	47.	5.0	
Ethylbenzene	100-41-4	48.	5.0	
m,p-Xylene	136777-61-2	100	5.0	
o-Xylene	95-47-6	50.	5.0	
Styrene	100-42-5	49.	5.0	
Bromoform	75-25-2	49.	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	52.	5.0	
1,3-Dichlorobenzene	541-73-1	48.	5.0	
1,4-Dichlorobenzene	106-46-7	48.	5.0	
1,2-Dichlorobenzene	95-50-1	48.	5.0	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38532LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	28-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	106%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	109%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	42.	5.0	
Vinyl Chloride	75-01-4	43.	5.0	
Bromomethane	74-83-9	45.	5.0	
Chloroethane	75-00-3	22.	5.0	
Trichlorofluoromethane	75-69-4	44.	5.0	
Acetone	67-64-1	41.	10.	
1,1-Dichloroethene	75-35-4	42.	5.0	
Carbon Disulfide	75-15-0	42.	5.0	
Methylene Chloride	75-09-2	42.	5.0	
trans-1,2-Dichloroethene	156-60-5	43.	5.0	
Vinyl Acetate	108-05-4	43.	10.	
1,1-Dichloroethane	75-34-3	43.	5.0	
2-Butanone	78-93-3	45.	10.	
cis-1,2-Dichloroethene	156-59-2	44.	5.0	
Chloroform	67-66-3	44.	5.0	
1,1,1-Trichloroethane	71-55-6	44.	5.0	
Carbon tetrachloride	56-23-5	44.	5.0	
1,2-Dichloroethane	107-06-2	45.	5.0	
Benzene	71-43-2	46.	5.0	
Trichloroethene	79-01-6	48.	5.0	
1,2-Dichloropropane	78-87-5	45.	5.0	
Bromodichloromethane	75-27-4	47.	5.0	
2-Chloroethylvinylether	110-75-8	190	20.	
4-Methyl-2-Pentanone	108-10-1	50.	10.	
cis-1,3-Dichloropropene	10061-01-5	45.	5.0	
Toluene	108-88-3	47.	5.0	
trans-1,3-Dichloropropene	10061-02-6	47.	5.0	
2-Hexanone	591-78-6	53.	10.	
1,1,2-Trichloroethane	79-00-5	49.	5.0	
Tetrachloroethene	127-18-4	46.	5.0	
Dibromochloromethane	124-48-1	47.	5.0	
Chlorobenzene	108-90-7	48.	5.0	
Ethylbenzene	100-41-4	47.	5.0	
m,p-Xylene	136777-61-2	100	5.0	
o-Xylene	95-47-6	50.	5.0	
Styrene	100-42-5	50.	5.0	
Bromoform	75-25-2	50.	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	46.	5.0	
1,3-Dichlorobenzene	541-73-1	48.	5.0	
1,4-Dichlorobenzene	106-46-7	48.	5.0	
1,2-Dichlorobenzene	95-50-1	48.	5.0	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38559LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	107%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	110%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	40.	5.0	
Vinyl Chloride	75-01-4	41.	5.0	
Bromomethane	74-83-9	26.	5.0	
Chloroethane	75-00-3	20.	5.0	
Trichlorofluoromethane	75-69-4	44.	5.0	
Acetone	67-64-1	43.	10.	B
1,1-Dichloroethene	75-35-4	41.	5.0	
Carbon Disulfide	75-15-0	42.	5.0	
Methylene Chloride	75-09-2	41.	5.0	
trans-1,2-Dichloroethene	156-60-5	42.	5.0	
Vinyl Acetate	108-05-4	44.	10.	
1,1-Dichloroethane	75-34-3	42.	5.0	
2-Butanone	78-93-3	43.	10.	
cis-1,2-Dichloroethene	156-59-2	43.	5.0	
Chloroform	67-66-3	43.	5.0	
1,1,1-Trichloroethane	71-55-6	43.	5.0	
Carbon tetrachloride	56-23-5	45.	5.0	
1,2-Dichloroethane	107-06-2	45.	5.0	
Benzene	71-43-2	45.	5.0	
Trichloroethene	79-01-6	44.	5.0	
1,2-Dichloropropane	78-87-5	44.	5.0	
Bromodichloromethane	75-27-4	45.	5.0	
2-Chloroethylvinylether	110-75-8	170	20.	
4-Methyl-2-Pentanone	108-10-1	46.	10.	
cis-1,3-Dichloropropene	10061-01-5	43.	5.0	
Toluene	108-88-3	46.	5.0	
trans-1,3-Dichloropropene	10061-02-6	44.	5.0	
2-Hexanone	591-78-6	49.	10.	
1,1,2-Trichloroethane	79-00-5	45.	5.0	
Tetrachloroethene	127-18-4	46.	5.0	
Dibromochloromethane	124-48-1	44.	5.0	
Chlorobenzene	108-90-7	45.	5.0	
Ethylbenzene	100-41-4	45.	5.0	
m,p-Xylene	136777-61-2	96.	5.0	
o-Xylene	95-47-6	47.	5.0	
Styrene	100-42-5	47.	5.0	
Bromoform	75-25-2	46.	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	47.	5.0	
1,3-Dichlorobenzene	541-73-1	46.	5.0	
1,4-Dichlorobenzene	106-46-7	45.	5.0	
1,2-Dichlorobenzene	95-50-1	45.	5.0	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
LATILE ORGANICS BY GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38561LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	30-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	063096-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	108%	84-122
Toluene-d8	111%	87-117
Bromofluorobenzene	112%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	40.	5.0	
Vinyl Chloride	75-01-4	42.	5.0	
Bromomethane	74-83-9	27.	5.0	
Chloroethane	75-00-3	16.	5.0	
Trichlorofluoromethane	75-69-4	45.	5.0	
Acetone	67-64-1	45.	10.	
1,1-Dichloroethene	75-35-4	42.	5.0	
Carbon Disulfide	75-15-0	42.	5.0	
Methylene Chloride	75-09-2	41.	5.0	
trans-1,2-Dichloroethene	156-60-5	42.	5.0	
Vinyl Acetate	108-05-4	44.	10.	
1,1-Dichloroethane	75-34-3	42.	5.0	
2-Butanone	78-93-3	43.	10.	
cis-1,2-Dichloroethene	156-59-2	43.	5.0	
Chloroform	67-66-3	43.	5.0	
1,1,1-Trichloroethane	71-55-6	44.	5.0	
Carbon tetrachloride	56-23-5	47.	5.0	
1,2-Dichloroethane	107-06-2	46.	5.0	
Benzene	71-43-2	46.	5.0	
Trichloroethene	79-01-6	46.	5.0	
1,2-Dichloropropane	78-87-5	45.	5.0	
Bromodichloromethane	75-27-4	46.	5.0	
2-Chloroethylvinylether	110-75-8	170	20.	
4-Methyl-2-Pentanone	108-10-1	48.	10.	
cis-1,3-Dichloropropene	10061-01-5	45.	5.0	
Toluene	108-88-3	47.	5.0	
trans-1,3-Dichloropropene	10061-02-6	45.	5.0	
2-Hexanone	591-78-6	50.	10.	
1,1,2-Trichloroethane	79-00-5	48.	5.0	
Tetrachloroethene	127-18-4	47.	5.0	
Dibromochloromethane	124-48-1	46.	5.0	
Chlorobenzene	108-90-7	47.	5.0	
Ethylbenzene	100-41-4	47.	5.0	
m,p-Xylene	136777-61-2	98.	5.0	
o-Xylene	95-47-6	48.	5.0	
Styrene	100-42-5	48.	5.0	
Bromoform	75-25-2	48.	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	48.	5.0	
1,3-Dichlorobenzene	541-73-1	47.	5.0	
1,4-Dichlorobenzene	106-46-7	47.	5.0	
1,2-Dichlorobenzene	95-50-1	47.	5.0	

LOCKHEED ANALYTICAL SERVICES

MATRIX SPIKE DATA SUMMARY
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	C6-58	LAL Sample ID:	38532MS
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	28-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	107%	84-122
Toluene-d8	111%	87-117
Bromofluorobenzene	111%	83-118

Constituent	Spike Added ug/L	Sample Concentration ug/L	MS Concentration ug/L	% Recovery	QC Limits % Recovery
1,1-Dichloroethene	50.0	0.000	40.4	81	62-124
Benzene	50.0	0.000	44.3	89	68-128
Trichloroethene	50.0	0.000	42.6	85	65-125
Toluene	50.0	0.000	45.0	90	69-129
Chlorobenzene	50.0	0.000	43.8	88	68-128

LOCKHEED ANALYTICAL SERVICES

MATRIX SPIKE DATA SUMMARY
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	C6-R04	LAL Sample ID:	38559MS
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	107%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	110%	83-118

Constituent	Spike Added ug/L	Sample Concentration ug/L	MS Concentration ug/L	% Recovery	QC Limits % Recovery
1,1-Dichloroethene	50.0	0.000	40.7	81	62-124
Benzene	50.0	0.000	43.9	88	68-128
Trichloroethene	50.0	0.000	43.1	86	65-125
Toluene	50.0	0.000	44.8	90	69-129
Chlorobenzene	50.0	0.000	44.5	89	68-128

LOCKHEED ANALYTICAL SERVICES

MATRIX SPIKE DUPLICATE DATA SUMMARY
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	C6-58	LAL Sample ID:	38532MSD
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	28-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	108%	84-122
Toluene-d8	111%	87-117
Bromofluorobenzene	110%	83-118

Constituent	Spike Added ug/L	MSD Concentration ug/L	% Recovery	RPD	QC Limits RPD	QC Limits % Recovery
1,1-Dichloroethene	50.0	41.0	82	2	14	62-124
Benzene	50.0	45.0	90	2	11	68-128
Trichloroethene	50.0	43.5	87	2	14	65-125
Toluene	50.0	46.0	92	2	13	69-129
Chlorobenzene	50.0	45.3	91	3	13	68-128

LOCKHEED ANALYTICAL SERVICES

MATRIX SPIKE DUPLICATE DATA SUMMARY
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	C6-R04	LAL Sample ID:	38559MSD
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	107%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	110%	83-118

Constituent	Spike Added ug/L	MSD Concentration ug/L	% Recovery	RPD	QC Limits RPD	QC Limits % Recovery
1,1-Dichloroethene	50.0	43.1	86	6	14	62-124
Benzene	50.0	47.1	94	7	11	68-128
Trichloroethene	50.0	46.0	92	7	14	65-125
Toluene	50.0	47.9	96	7	13	69-129
Chlorobenzene	50.0	47.4	95	6	13	68-128

LOCKHEED ANALYTICAL SERVICES

LCS DATA SUMMARY
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38532LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	28-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	106%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	109%	83-118

Constituent	Spike Added ug/L	LCS Concentration ug/L	LCS % Recovery	QC Limits
1,1-Dichloroethene	50.0	41.9	84	62-124
Benzene	50.0	45.8	92	68-128
Trichloroethene	50.0	47.8	96	65-125
Toluene	50.0	46.8	94	69-129
Chlorobenzene	50.0	47.8	96	68-128

LOCKHEED ANALYTICAL SERVICES

LCS DATA SUMMARY
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38559LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	107%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	110%	83-118

Constituent	Spike Added ug/L	LCS Concentration ug/L	LCS % Recovery	QC Limits
1,1-Dichloroethene	50.0	41.3	83	62-124
Benzene	50.0	44.8	90	68-128
Trichloroethene	50.0	44.5	89	65-125
Toluene	50.0	45.8	92	69-129
Chlorobenzene	50.0	45.1	90	68-128

LOCKHEED ANALYTICAL SERVICES

LCS DATA SUMMARY
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38561LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	30-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	063096-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	108%	84-122
Toluene-d8	111%	87-117
Bromofluorobenzene	112%	83-118

Constituent	Spike Added ug/L	LCS Concentration ug/L	LCS % Recovery	QC Limits
1,1-Dichloroethene	50.0	41.7	83	62-124
Benzene	50.0	46.5	93	68-128
Trichloroethene	50.0	45.7	91	65-125
Toluene	50.0	47.2	94	69-129
Chlorobenzene	50.0	46.5	93	68-128

OCKHEED ANALYTICAL SERVICES

VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

strument ID: GC/MS-J

Date/Time Analyzed: 28-JUN-96 15:25
LAL Batch ID: 062896-8260-J2

		IS1 (PFB) Area	RT	IS2 (DFB) Area	RT	IS3 (CBZ) Area	RT	IS4 (DCB) Area	RT
12 HOUR STD		1219666	10.50	2253245	11.61	2314245	15.63	1828351	19.64
UPPER LIMIT		2439332	11.00	4506490	12.11	4628490	16.13	3656702	20.14
LOWER LIMIT		609833	10	1126622	11.11	1157122	15.13	914175	19.14
Client Sample ID	LAL Sample ID								
ethod Blank	38532MB	1321383	10.50	2373005	11.61	2427107	15.63	1924071	19.63
6-58	38532MS	1284181	10.52	2381208	11.63	2451471	15.64	1995346	19.64
6-56	L7305-1	1281614	10.52	2296589	11.63	2344735	15.64	1847622	19.64
6-58	L7305-4	1296600	10.51	2336549	11.62	2398587	15.64	1884986	19.64
3-62	L7305-7	1277231	10.51	2277090	11.62	2350152	15.64	1829655	19.65
ab Ctrl Sample	38532LCS	1265424	10.51	2384369	11.62	2414876	15.64	1980026	19.64
6-58	38532MSD	1277450	10.52	2376579	11.63	2414214	15.64	1976328	19.64
6-R37	L7305-10	1259988	10.51	2282662	11.62	2317665	15.64	1840712	19.64
7-51	L7305-25	1089061	10.52	1955933	11.63	2005466	15.64	1570589	19.64
7-33	L7305-28	1226654	10.51	2185910	11.62	2249236	15.64	1750854	19.64
6-R36	L7305-36	1235275	10.51	2211811	11.62	2272504	15.64	1790477	19.64
8-D1	L7305-42	1232830	10.53	2238842	11.64	2262463	15.65	1777410	19.66
7-15	L7305-51	1204846	10.51	2175724	11.62	2219926	15.64	1717159	19.64
-61	L7305-63	1209586	10.51	2187835	11.62	2220261	15.64	1788112	19.64
BS-001	L7312-13	1330394	10.51	2397724	11.63	2428926	15.64	1857086	19.64

EA UPPER LIMIT = +100% of internal standard area
EA LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5
IS4 (DCB) = 1,4-Dichlorobenzene-d4

OCKHEED ANALYTICAL SERVICES

VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

strument ID: GC/MS-J

Date/Time Analyzed: 29-JUN-96 13:06
LAL Batch ID: 062996-8260-J2

		IS1 (PFB) Area	RT	IS2 (DFB) Area	RT	IS3 (CBZ) Area	RT	IS4 (DCB) Area	RT
12 HOUR STD		1169492	10.51	2144186	11.62	2203098	15.63	1801468	19.63
UPPER LIMIT		2338984	11.01	4288372	12.12	4406196	16.13	3602936	20.13
LOWER LIMIT		584746	10.01	1072093	11.12	1101549	15.13	900734	19.13
Client Sample ID	LAL Sample ID								
ethod Blank	38559MB	1263033	10.50	2240109	11.62	2300109	15.63	1812323	19.63
5-R04	38559MS	1219148	10.52	2262417	11.63	2310398	15.64	1913729	19.65
ab Ctrl Sample	38559LCS	1229258	10.51	2273646	11.62	2321478	15.64	1898419	19.64
5-R04	38559MSD	1175278	10.52	2176258	11.63	2220170	15.65	1819637	19.64
2-64	L7305-13	1246045	10.52	2253775	11.63	2286481	15.64	1814010	19.64
7-54	L7305-16	1215367	10.51	2157698	11.62	2215047	15.65	1738616	19.65
3-50	L7305-19	1218511	10.52	2149830	11.63	2213297	15.64	1736714	19.65
3-48	L7305-22	1201404	10.51	2150694	11.62	2209130	15.64	1768843	19.65
5-R04	L7305-31	1215210	10.52	2169257	11.63	2215934	15.64	1743630	19.64
5-R34	L7305-39	1242859	10.52	2210127	11.63	2247386	15.64	1759083	19.64
BS-002	L7305-45	1228051	10.51	2206154	11.63	2258728	15.64	1783936	19.64
3-67	L7305-54	1184610	10.52	2110334	11.63	2148679	15.64	1710044	19.64
BS-003	L7305-57	1236325	10.51	2221254	11.62	2256109	15.64	1781008	19.64
BS-001	L7305-60	1185499	10.52	2119800	11.63	2160425	15.64	1723704	19.64
BS-004	L7312-10	1237268	10.51	2217116	11.62	2282593	15.64	1788272	19.64

A UPPER LIMIT = +100% of internal standard area
EA LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5
IS4 (DCB) = 1,4-Dichlorobenzene-d4

)CKHEED ANALYTICAL SERVICES

VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

trument ID: GC/MS-J

Date/Time Analyzed: 30-JUN-96 11:02
LAL Batch ID: 063096-8260-J2

		IS1 (PFB) Area	RT	IS2 (DFB) Area	RT	IS3 (CBZ) Area	RT	IS4 (DCB) Area	RT
12 HOUR STD		1160171	10.50	2137612	11.61	2195848	15.63	1789752	19.63
UPPER LIMIT		2320342	11.00	4275224	12.11	4391696	16.13	3579504	20.13
LOWER LIMIT		580085	10	1068806	11.11	1097924	15.13	894876	19.13
Client Sample ID	LAL Sample ID								
thod Blank	38561MB	1234222	10.50	2204176	11.61	2249652	15.63	1805105	19.63
-76	L7312-1	1248127	10.51	2212641	11.62	2282696	15.64	1816997	19.64
-65	L7312-4	1252310	10.51	2204839	11.62	2245597	15.64	1778515	19.64
-D2	L7312-7	1218806	10.52	2166896	11.63	2209150	15.64	1720052	19.64
b Ctrl Sample	38561LCS	1196558	10.50	2173669	11.61	2243721	15.63	1840125	19.63
-34	L7305-48	1262653	10.50	2231139	11.61	2262961	15.63	1803171	19.63
-R08	L7312-16	1250272	10.52	2231306	11.63	2269493	15.64	1785087	19.64

A UPPER LIMIT = +100% of internal standard area
A LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5
IS4 (DCB) = 1,4-Dichlorobenzene-d4

RUN LOGS / INJECTION LOGS

LOCKHEED ANALYTICAL LAB REVIEWED BY MMS 5-31-96 INSTRUMENT ID # GCMS 0831 PAGE #

ANALYST	DATE	L. J.	LAL #	DESCRIPTION/CLIENT	SOL #	MATRIX/DIL	DATA FILE	ILE	METHOD FILE	ID FILE	DR	ACS #	COMMENTS
MM	5/21	1220	37266MB	method blank	696-73-3	soil	J2678	MJ1103	JS8260	N/A	OK	2	
		1256	37266LCS	LCS	696-73-1,3	↓	79				OK	3	
		1400	L7050-26	RUST 282-MW01-9.0-10.0	696-73-3	5.02g	80				OK	4	
		1436	L7050-26	-24.0-25.0		5.04	81				OK	5	
		1512	L7050-30	39.0-40.0		5.00	82				OK	6	
		1548	L7050-32	-59.0-60.0		5.07	83				OK	7	
MM	5/28	0856	—	50 ng BFB	696-70-1	—	J2684	MJ1103	MEJBFB	N/A	OK	N/A	
		0921	VSTD37494	cont. calib.	696-73-1,2	soil	85		JS8260		OK	1	
		0957	37494MB	method blank	696-73-3		86				DNR	2	BFBT
		1104	↓	↓	↓		87				DNR	2	Bromochloromethane & RDL
		1140	37494LCS	LCS	696-73-1,3	↓	88	↓	↓	↓	DNR	3	Soln Check - Good
↓	↓	1428	VSTD050	Cmpd Response Check	696-73-1,2	↓	89	↓	↓	↓	DNR	1	Cmpd response ✓ after maintenance.
SL	5/28	1650	—	50 ng BFB	696-70-1	—	J2690	MJ1103	MEJBFB	—	OK	—	
		1725	—	VSTD005	696-73-1,2	—	91		JS8260	—		1	All targets detected at RDL.
		1801	—	VSTD020		—	92			—		2	SOIL
		1837	—	VSTD050 (37532)		—	93			—		3	5 POINT
		1913	—	VSTD100		—	94			—		4	
		1949	—	VSTD150		—	95			—		5	GOOD
		2025	—	VSTD200	↓	—	96			—	↓	6	
		2101	—	BLANK	696-77-3	—	97			—	DNR	7	
		2137	—	37532MB	↓	—	98			—	OK	8	
		2213	—	37532LCS	696-77-3 696-71-1	—	99			—	OK	9	Passes as QCCS
↓	↓	2315	L7040-6	V14SD11 TT	696-77-3	5.02	J2700	↓	↓	—	OK	10	
MM	5/29	0943	—	50 ng BFB	696-70-1	—	J2701	MJ1103	MEJBFB	N/A	OK	N/A	
		1010	—	VSTD005	696-77-1,2	H_2O	02		JW8260		OK	1	All targets detected at RDL.
		1046	—	VSTD020			03				OK	2	
		1119	—	VSTD050			04					3	H_2O
		1154	—	VSTD100			05					4	5 POINT
		1230	—	VSTD150			06					5	GOOD
		1305	—	VSTD200	↓		07				↓	6	
		1340	—	Inst. carryover blank	696-77-3		08				DNR	7	
		1415	—	↓	↓		09				DNR	8	
↓	↓	1448	—	QCCS	696-77-3	↓	10	↓	↓	↓	OK	9	QCCS Passes

000042

1996

LOCKHEED ...LYTICAL LAB REVIEWED BY _____ MENT ID # GCMS J 0831 PAGE # 000078

ANA-LYST	DATE	TIME OF INJ.	LAL #	DESCRIPTION/CLIENT	SOL #	MATRIX/DIL	DATA FILE	TUNE FILE	METHOD FILE	ID FILE	DR	ACS #	COMMENTS
SR	6/26	1723	–	50 ng BFB	696-82-1	–	J2836	MJ1103	MEJBFB	–	ok	–	
		1752	–	VSTD38481	696-77-1,2	–	37		JW82600	–	ok	1	
		1829	–	38481MB	696-77-1 696-78-2	–	38			–	ok	2	
		1907	–	38481LCS	696-77-1 696-79-2	–	39			–	ok	3	
		2052	L72639	DL NBCA1083ISPO11LH	696-77-1 696-78-2	1.00	40			–	Rep	4	Report w/ J2821
		2130	38481MS		696-77-1 696-79-2	1.01	41			–	ok	5	
		2209	38481MSD			1.01	42			–	ok	6	
DL	6/27	1421	–	50 ng BFB	696-82-1	–	J2843	MJ1103	MEJBFB	–	OK	–	
SR		1444	–	VSTD 38508	696-77-1/2	–	44		JW8260	–	ok	1	
		1541	–	38508MB	696-77-3	–	45			–	ok	2	
		1618	L7336-1	DL LA591145-99		–	46			–	DNR	3	
		1655	L7336-2	DL LA59043-82		–	47			–	DNR	4	
		1815	L7336-2	DL LA59043-82		1:250	48			–	ok	8	
		1852	L7336-3	DL LA59043-128		1:250	49			–	ok	9	
		1929	L7336-4	DL LA58909-116		1:250	50			–	ok	10	
		2006	L7336-1	DL LA591145-99		1:500	51			–	ok	11	
		2043	–	VSTD38508-2	696-77-1/2	–	52			–	ok	7	
		2120	–	~~DSC 6/27/96~~ 38508LCS	834-71-1 696-77-3	–	53			–	ok	812	
		2157	–	BLANK		–	54			–	DNR	43	cleanup only
		2233	–			–	55			–		54	
		1310	–			–	56			–		65	
		2347	–			–	57			–		6	
SR	6/28	1458	–	50 ng BFB	696-82-1	–	J2858	MJ1103	MEJBFB	–	ok	–	
		1525	–	VSTD38532	696-77-1/2	–	59		JW82600	–	ok	1	
		1602	–	38532MB	696-77-3	–	60			–	ok	2	
		1639	–	38532LCS	696-77-3 834-71-1	–	61			–	ok	3	
		1718	L7312-13	EBS-001	696-77-3	1:20	62			pH=0	ok	4	BTEX only
		1755	L7305-4	CL-58			63			7	ok	5	
		1832	38530MS		696-77-3 834-71-1		64			7	ok	6	
		1909	38530MSD				65			7	ok	7	
		1946	L7305-1	CL-5R	696-77-3		66			7	ok	8	
		2023	L7305-7	A3-62			67			0	ok	9	

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LOCKHEED ANALYTICAL LAB REVIEWED BY _____ INSTRUMENT ID # GCMS J 0831 PAGE # 0 179

ANALYST	DATE	TIME	LAL #	DESCRIPTION/CLIENT	SOL #	MATRIX/DIL	DATA FILE	TUNE FILE	METHOD FILE	ID FILE	DR	RES #	COMMENTS
SR	6/28	2100	L7305-10	C6 - R37	L696-77-3	H20	J2868	MJ1103	JW8260	pH = 7	Ok	10	BTEX ONLY
		2137	L7305-25	D7 - 51			69			7	ok	11	
		2214	L7305-28	D7 - 33			70			7	Ok	12	
		2251	L7305-36	C6 - R86			71			7	ok	13	
		2328	L7305-42	B8 - D1			72			7	ok	14	
		0005	L7305-51	D7 - 15			73			7	ok	15	
		0042	L7305-63	B4 - 61			74			7	ok	16	
SR	6/29	1239	-	50ng BFB	L696-82-1	-	J2875	MJ1103	MEJBFB	-	ok	-	
		1306	-	VSTD38559	L696-77-1/2	-	76		JW8260	-	ok	1	
		1340	-	38559MB	L696-77-3	-	77			-	ok	2	
		1415	-	38559LCS	L696-77-3 834-71-1	-	78			-	ok	3	
		1451	L7312-10	TBS-004	L696-77-3	pH = 3	79			-	Ok	4	
		1527	L7305-45	TBS-002		2	80			-	Ok	5	
		1604	L7305-57	TBS-003		2	81			-	Ok	6	
		1641	L7305-60	TBS-001		2	82			-	ok	7	
		1718	L7305-31	C6 - R04		7	83			-	ok	8	
		1755	38559MS		L696-77-3 834-71-1	7	84			-	ok	9	
		1832	38559MSD			7	85			-	ok	10	
		1909	L7305-13	C2 -64	L696-77-3	7	86			-	Ok	11	
		1946	L7305-16	C7 - 54		4	87			-	Ok	12	
		2023	L7305-19	D8 - 50		7	88			-	ok	13	
		2100	L7305-22	D8 - 48		7	89			-	ok	14	
		2137	L7305-31	D6 - R34		7	90			-	Ok	15	
		2213	L7305-54	I3 - 67		7	91			-	ok	16	
SR	6/30	1036	-	50 ng BFB	L696-82-1	-	J2892	MJ1103	MEJBFB	-	ok	-	
		1102	-	VSTD38561	L696-77-1/2	-	93		JW8260	-	ok	1	
		1138	-	38561MB	L696-77-3	-	94			-	ok	2	
		1215	-	38561LCS	L696-77-3 834-71-1	-	95			-	ok	3	
		1252	L7305-48	D7 - 34	L696-77-3	pH = 7	96			-	ok	4	
		1329	L7312-1	C4 - 76		7	97			-	ok	5	
		1406	L7312-4	C3 - 65		7	98			-	ok	6	
		1442	L7312-7	B8 - D2		7	99			-	Ok	7	
		1519	L7312-16	B5 - R08		7	J2900			-	ok	8	

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EPA METHOD 8270 (Semivolatile Organics)

SAMPLE RESULTS FORMS AND QC SUMMARIES

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
'0 SEMI-VOLATILES

Client Sample ID:	C2-64	LAL Sample ID:	L7305-103
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	48%	31-110
Phenol-d5	77%	27-111
Nitrobenzene-d5	52%	40-114
2-Fluorobiphenyl	51%	41-111
2,4,6-Tribromophenol	95%	34-147
Terphenyl-d14	51%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	<10.	10.	
bis(2-Chloroethyl)ether	111-44-4	<10.	10.	
2-Chlorophenol	95-57-8	<10.	10.	
1,3-Dichlorobenzene	541-73-1	<10.	10.	
1,4-Dichlorobenzene	106-46-7	<10.	10.	
Benzyl alcohol	100-51-6	<20.	20.	
1,2-Dichlorobenzene	95-50-1	<10.	10.	
2-Methylphenol	95-48-7	<10.	10.	
bis(2-chloroisopropyl)ether	108-60-1	<10.	10.	
4-Methylphenol	106-44-5	<10.	10.	
N-Nitroso-di-n-propylamine	621-64-7	<10.	10.	
Hexachloroethane	67-72-1	<10.	10.	
Nitrobenzene	98-95-3	<10.	10.	
Isophorone	78-59-1	<10.	10.	
2-Nitrophenol	88-75-5	<10.	10.	
2,4-Dimethylphenol	105-67-9	<10.	10.	
Benzoic acid	65-85-0	<50.	50.	
bis(2-Chloroethoxy)methane	111-91-1	<10.	10.	
2,4-Dichlorophenol	120-83-2	<10.	10.	
1,2,4-Trichlorobenzene	120-82-1	<10.	10.	
Naphthalene	91-20-3	<10.	10.	
4-Chloroaniline	106-47-8	<20.	20.	
Hexachlorobutadiene	87-68-3	<10.	10.	
4-Chloro-3-methylphenol	59-50-7	<20.	20.	
2-Methylnaphthalene	91-57-6	<10.	10.	
Hexachlorocyclopentadiene	77-47-4	<10.	10.	
2,4,6-Trichlorophenol	88-06-2	<10.	10.	
2,4,5-Trichlorophenol	95-95-4	<10.	10.	
2-Chloronaphthalene	91-58-7	<10.	10.	
2-Nitroaniline	88-74-4	<50.	50.	
Dimethylphthalate	131-11-3	<10.	10.	
Acenaphthylene	208-96-8	<10.	10.	
2,6-Dinitrotoluene	606-20-2	<10.	10.	
3-Nitroaniline	99-09-2	<50.	50.	
Acenaphthene	83-32-9	<10.	10.	
2,4-Dinitrophenol	51-28-5	<50.	50.	
4-Nitrophenol	100-02-7	<50.	50.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
0 SEMI-VOLATILES

Client Sample ID:	C2-64	LAL Sample ID:	L7305-103
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	<10.	10.	
2,4-Dinitrotoluene	121-14-2	<10.	10.	
Diethylphthalate	84-66-2	<10.	10.	
4-Chlorophenyl-phenylether	7005-72-3	<10.	10.	
Fluorene	86-73-7	<10.	10.	
4-Nitroaniline	100-01-6	<20.	20.	
4,6-Dinitro-2-methylphenol	534-52-1	<50.	50.	
N-Nitrosodiphenylamine (1)	86-30-6	<10.	10.	
4-Bromophenyl-phenylether	101-55-3	<10.	10.	
Hexachlorobenzene	118-74-1	<10.	10.	
Pentachlorophenol	87-86-5	<50.	50.	
Phenanthrene	85-01-8	<10.	10.	
Anthracene	120-12-7	<10.	10.	
Carbazole	86-74-8	<10.	10.	
Di-n-butylphthalate	84-74-2	<10.	10.	
Fluoranthene	206-44-0	<10.	10.	
Pyrene	129-00-0	<10.	10.	
Butylbenzylphthalate	85-68-7	<10.	10.	
3,3'-Dichlorobenzidine	91-94-1	<20.	20.	
Benzo(a)anthracene	56-55-3	<10.	10.	
Chrysene	218-01-9	<10.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	<10.	10.	
Di-n-octylphthalate	117-84-0	<10.	10.	
Benzo(b)fluoranthene	205-99-2	<10.	10.	
Benzo(k)fluoranthene	207-08-9	<10.	10.	
Benzo(a)pyrene	50-32-8	<10.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	<10.	10.	
Dibenz(a,h)anthracene	53-70-3	<10.	10.	
Benzo(g,h,i)perylene	191-24-2	<10.	10.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
) SEMI-VOLATILES

Client Sample ID:	C7-54	LAL Sample ID:	L7305-104
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	46%	31-110
Phenol-d5	72%	27-111
Nitrobenzene-d5	78%	40-114
2-Fluorobiphenyl	71%	41-111
2,4,6-Tribromophenol	81%	34-147
Terphenyl-d14	63%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	<10.	10.	
bis(2-Chloroethyl)ether	111-44-4	<10.	10.	
2-Chlorophenol	95-57-8	<10.	10.	
1,3-Dichlorobenzene	541-73-1	<10.	10.	
1,4-Dichlorobenzene	106-46-7	<10.	10.	
Benzyl alcohol	100-51-6	<20.	20.	
1,2-Dichlorobenzene	95-50-1	<10.	10.	
2-Methylphenol	95-48-7	<10.	10.	
bis(2-chloroisopropyl)ether	108-60-1	<10.	10.	
4-Methylphenol	106-44-5	<10.	10.	
N-Nitroso-di-n-propylamine	621-64-7	<10.	10.	
Hexachloroethane	67-72-1	<10.	10.	
Nitrobenzene	98-95-3	<10.	10.	
Isophorone	78-59-1	<10.	10.	
2-Nitrophenol	88-75-5	<10.	10.	
2,4-Dimethylphenol	105-67-9	<10.	10.	
Benzoic acid	65-85-0	<50.	50.	
bis(2-Chloroethoxy)methane	111-91-1	<10.	10.	
2,4-Dichlorophenol	120-83-2	<10.	10.	
1,2,4-Trichlorobenzene	120-82-1	<10.	10.	
Naphthalene	91-20-3	<10.	10.	
4-Chloroaniline	106-47-8	<20.	20.	
Hexachlorobutadiene	87-68-3	<10.	10.	
4-Chloro-3-methylphenol	59-50-7	<20.	20.	
2-Methylnaphthalene	91-57-6	<10.	10.	
Hexachlorocyclopentadiene	77-47-4	<10.	10.	
2,4,6-Trichlorophenol	88-06-2	<10.	10.	
2,4,5-Trichlorophenol	95-95-4	<10.	10.	
2-Chloronaphthalene	91-58-7	<10.	10.	
2-Nitroaniline	88-74-4	<50.	50.	
Dimethylphthalate	131-11-3	<10.	10.	
Acenaphthylene	208-96-8	<10.	10.	
2,6-Dinitrotoluene	606-20-2	<10.	10.	
3-Nitroaniline	99-09-2	<50.	50.	
Acenaphthene	83-32-9	<10.	10.	
2,4-Dinitrophenol	51-28-5	<50.	50.	
4-Nitrophenol	100-02-7	<50.	50.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
SEMI-VOLATILES

Client Sample ID:	C7-54	LAL Sample ID:	L7305-104
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	<10.	10.	
2,4-Dinitrotoluene	121-14-2	<10.	10.	
Diethylphthalate	84-66-2	<10.	10.	
4-Chlorophenyl-phenylether	7005-72-3	<10.	10.	
Fluorene	86-73-7	<10.	10.	
4-Nitroaniline	100-01-6	<20.	20.	
4,6-Dinitro-2-methylphenol	534-52-1	<50.	50.	
N-Nitrosodiphenylamine (1)	86-30-6	<10.	10.	
4-Bromophenyl-phenylether	101-55-3	<10.	10.	
Hexachlorobenzene	118-74-1	<10.	10.	
Pentachlorophenol	87-86-5	<50.	50.	
Phenanthrene	85-01-8	<10.	10.	
Anthracene	120-12-7	<10.	10.	
Carbazole	86-74-8	<10.	10.	
Di-n-butylphthalate	84-74-2	<10.	10.	
Fluoranthene	206-44-0	<10.	10.	
Pyrene	129-00-0	<10.	10.	
Butylbenzylphthalate	85-68-7	<10.	10.	
3,3'-Dichlorobenzidine	91-94-1	<20.	20.	
Benzo(a)anthracene	56-55-3	<10.	10.	
Chrysene	218-01-9	<10.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	<10.	10.	
Di-n-octylphthalate	117-84-0	<10.	10.	
Benzo(b)fluoranthene	205-99-2	<10.	10.	
Benzo(k)fluoranthene	207-08-9	<10.	10.	
Benzo(a)pyrene	50-32-8	<10.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	<10.	10.	
Dibenz(a,h)anthracene	53-70-3	<10.	10.	
Benzo(g,h,i)perylene	191-24-2	<10.	10.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
'0 SEMI-VOLATILES

Client Sample ID:	D8-50	LAL Sample ID:	L7305-105
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.02

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	69%	31-110
Phenol-d5	77%	27-111
Nitrobenzene-d5	69%	40-114
2-Fluorobiphenyl	53%	41-111
2,4,6-Tribromophenol	77%	34-147
Terphenyl-d14	53%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	<10.	10.	
bis(2-Chloroethyl)ether	111-44-4	<10.	10.	
2-Chlorophenol	95-57-8	<10.	10.	
1,3-Dichlorobenzene	541-73-1	<10.	10.	
1,4-Dichlorobenzene	106-46-7	<10.	10.	
Benzyl alcohol	100-51-6	<20.	20.	
1,2-Dichlorobenzene	95-50-1	<10.	10.	
2-Methylphenol	95-48-7	<10.	10.	
bis(2-chloroisopropyl)ether	108-60-1	<10.	10.	
4-Methylphenol	106-44-5	<10.	10.	
N-Nitroso-di-n-propylamine	621-64-7	<10.	10.	
Hexachloroethane	67-72-1	<10.	10.	
Nitrobenzene	98-95-3	<10.	10.	
Isophorone	78-59-1	<10.	10.	
2-Nitrophenol	88-75-5	<10.	10.	
2,4-Dimethylphenol	105-67-9	<10.	10.	
Benzoic acid	65-85-0	<51.	51.	
bis(2-Chloroethoxy)methane	111-91-1	<10.	10.	
2,4-Dichlorophenol	120-83-2	<10.	10.	
1,2,4-Trichlorobenzene	120-82-1	<10.	10.	
Naphthalene	91-20-3	<10.	10.	
4-Chloroaniline	106-47-8	<20.	20.	
Hexachlorobutadiene	87-68-3	<10.	10.	
4-Chloro-3-methylphenol	59-50-7	<20.	20.	
2-Methylnaphthalene	91-57-6	15.	10.	
Hexachlorocyclopentadiene	77-47-4	<10.	10.	
2,4,6-Trichlorophenol	88-06-2	<10.	10.	
2,4,5-Trichlorophenol	95-95-4	<10.	10.	
2-Chloronaphthalene	91-58-7	<10.	10.	
2-Nitroaniline	88-74-4	<51.	51.	
Dimethylphthalate	131-11-3	<10.	10.	
Acenaphthylene	208-96-8	<10.	10.	
2,6-Dinitrotoluene	606-20-2	<10.	10.	
3-Nitroaniline	99-09-2	<51.	51.	
Acenaphthene	83-32-9	<10.	10.	
2,4-Dinitrophenol	51-28-5	<51.	51.	
4-Nitrophenol	100-02-7	<51.	51.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
0 SEMI-VOLATILES

Client Sample ID:	D8-50	LAL Sample ID:	L7305-105
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.02

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	<10.	10.	
2,4-Dinitrotoluene	121-14-2	<10.	10.	
Diethylphthalate	84-66-2	<10.	10.	
4-Chlorophenyl-phenylether	7005-72-3	<10.	10.	
Fluorene	86-73-7	<10.	10.	
4-Nitroaniline	100-01-6	<20.	20.	
4,6-Dinitro-2-methylphenol	534-52-1	<51.	51.	
N-Nitrosodiphenylamine (1)	86-30-6	<10.	10.	
4-Bromophenyl-phenylether	101-55-3	<10.	10.	
Hexachlorobenzene	118-74-1	<10.	10.	
Pentachlorophenol	87-86-5	<51.	51.	
Phenanthrene	85-01-8	<10.	10.	
Anthracene	120-12-7	<10.	10.	
Carbazole	86-74-8	<10.	10.	
Di-n-butylphthalate	84-74-2	<10.	10.	
Fluoranthene	206-44-0	<10.	10.	
Pyrene	129-00-0	<10.	10.	
Butylbenzylphthalate	85-68-7	<10.	10.	
3,3'-Dichlorobenzidine	91-94-1	<20.	20.	
Benzo(a)anthracene	56-55-3	<10.	10.	
Chrysene	218-01-9	<10.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	3.5	10.	J
Di-n-octylphthalate	117-84-0	<10.	10.	
Benzo(b)fluoranthene	205-99-2	<10.	10.	
Benzo(k)fluoranthene	207-08-9	<10.	10.	
Benzo(a)pyrene	50-32-8	<10.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	<10.	10.	
Dibenz(a,h)anthracene	53-70-3	<10.	10.	
Benzo(g,h,i)perylene	191-24-2	<10.	10.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
'0 SEMI-VOLATILES

Client Sample ID:	D8-48	LAL Sample ID:	L7305-106
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	30% *	31-110
Phenol-d5	59%	27-111
Nitrobenzene-d5	68%	40-114
2-Fluorobiphenyl	57%	41-111
2,4,6-Tribromophenol	66%	34-147
Terphenyl-d14	62%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	<10.	10.	
bis(2-Chloroethyl)ether	111-44-4	<10.	10.	
2-Chlorophenol	95-57-8	<10.	10.	
1,3-Dichlorobenzene	541-73-1	<10.	10.	
1,4-Dichlorobenzene	106-46-7	<10.	10.	
Benzyl alcohol	100-51-6	<20.	20.	
1,2-Dichlorobenzene	95-50-1	<10.	10.	
2-Methylphenol	95-48-7	<10.	10.	
bis(2-chloroisopropyl)ether	108-60-1	<10.	10.	
4-Methylphenol	106-44-5	<10.	10.	
N-Nitroso-di-n-propylamine	621-64-7	<10.	10.	
Hexachloroethane	67-72-1	<10.	10.	
Nitrobenzene	98-95-3	<10.	10.	
Isophorone	78-59-1	<10.	10.	
2-Nitrophenol	88-75-5	<10.	10.	
2,4-Dimethylphenol	105-67-9	<10.	10.	
Benzoic acid	65-85-0	<50.	50.	
bis(2-Chloroethoxy)methane	111-91-1	<10.	10.	
2,4-Dichlorophenol	120-83-2	<10.	10.	
1,2,4-Trichlorobenzene	120-82-1	<10.	10.	
Naphthalene	91-20-3	<10.	10.	
4-Chloroaniline	106-47-8	<20.	20.	
Hexachlorobutadiene	87-68-3	<10.	10.	
4-Chloro-3-methylphenol	59-50-7	<20.	20.	
2-Methylnaphthalene	91-57-6	<10.	10.	
Hexachlorocyclopentadiene	77-47-4	<10.	10.	
2,4,6-Trichlorophenol	88-06-2	<10.	10.	
2,4,5-Trichlorophenol	95-95-4	<10.	10.	
2-Chloronaphthalene	91-58-7	<10.	10.	
2-Nitroaniline	88-74-4	<50.	50.	
Dimethylphthalate	131-11-3	<10.	10.	
Acenaphthylene	208-96-8	<10.	10.	
2,6-Dinitrotoluene	606-20-2	<10.	10.	
3-Nitroaniline	99-09-2	<50.	50.	
Acenaphthene	83-32-9	<10.	10.	
2,4-Dinitrophenol	51-28-5	<50.	50.	
4-Nitrophenol	100-02-7	<50.	50.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
0 SEMI-VOLATILES

Client Sample ID:	D8-48	LAL Sample ID:	L7305-106
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	<10.	10.	
2,4-Dinitrotoluene	121-14-2	<10.	10.	
Diethylphthalate	84-66-2	<10.	10.	
4-Chlorophenyl-phenylether	7005-72-3	<10.	10.	
Fluorene	86-73-7	<10.	10.	
4-Nitroaniline	100-01-6	<20.	20.	
4,6-Dinitro-2-methylphenol	534-52-1	<50.	50.	
N-Nitrosodiphenylamine (1)	86-30-6	<10.	10.	
4-Bromophenyl-phenylether	101-55-3	<10.	10.	
Hexachlorobenzene	118-74-1	<10.	10.	
Pentachlorophenol	87-86-5	<50.	50.	
Phenanthrene	85-01-8	<10.	10.	
Anthracene	120-12-7	<10.	10.	
Carbazole	86-74-8	<10.	10.	
Di-n-butylphthalate	84-74-2	<10.	10.	
Fluoranthene	206-44-0	<10.	10.	
Pyrene	129-00-0	<10.	10.	
Butylbenzylphthalate	85-68-7	<10.	10.	
3,3'-Dichlorobenzidine	91-94-1	<20.	20.	
Benzo(a)anthracene	56-55-3	<10.	10.	
Chrysene	218-01-9	<10.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	<10.	10.	
Di-n-octylphthalate	117-84-0	<10.	10.	
Benzo(b)fluoranthene	205-99-2	<10.	10.	
Benzo(k)fluoranthene	207-08-9	<10.	10.	
Benzo(a)pyrene	50-32-8	<10.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	<10.	10.	
Dibenz(a,h)anthracene	53-70-3	<10.	10.	
Benzo(g,h,i)perylene	191-24-2	<10.	10.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
) SEMI-VOLATILES

Client Sample ID:	D8-48 --	LAL Sample ID:	L7305-106
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	30% *	31-110
Phenol-d5	55%	27-111
Nitrobenzene-d5	68%	40-114
2-Fluorobiphenyl	60%	41-111
2,4,6-Tribromophenol	67%	34-147
Terphenyl-d14	61%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	<10.	10.	
bis(2-Chloroethyl)ether	111-44-4	<10.	10.	
2-Chlorophenol	95-57-8	<10.	10.	
1,3-Dichlorobenzene	541-73-1	<10.	10.	
1,4-Dichlorobenzene	106-46-7	<10.	10.	
Benzyl alcohol	100-51-6	<20.	20.	
1,2-Dichlorobenzene	95-50-1	<10.	10.	
2-Methylphenol	95-48-7	<10.	10.	
bis(2-chloroisopropyl)ether	108-60-1	<10.	10.	
4-Methylphenol	106-44-5	<10.	10.	
N-Nitroso-di-n-propylamine	621-64-7	<10.	10.	
Hexachloroethane	67-72-1	<10.	10.	
Nitrobenzene	98-95-3	<10.	10.	
Isophorone	78-59-1	<10.	10.	
2-Nitrophenol	88-75-5	<10.	10.	
2,4-Dimethylphenol	105-67-9	<10.	10.	
Benzoic acid	65-85-0	<50.	50.	
bis(2-Chloroethoxy)methane	111-91-1	<10.	10.	
2,4-Dichlorophenol	120-83-2	<10.	10.	
1,2,4-Trichlorobenzene	120-82-1	<10.	10.	
Naphthalene	91-20-3	<10.	10.	
4-Chloroaniline	106-47-8	<20.	20.	
Hexachlorobutadiene	87-68-3	<10.	10.	
4-Chloro-3-methylphenol	59-50-7	<20.	20.	
2-Methylnaphthalene	91-57-6	<10.	10.	
Hexachlorocyclopentadiene	77-47-4	<10.	10.	
2,4,6-Trichlorophenol	88-06-2	<10.	10.	
2,4,5-Trichlorophenol	95-95-4	<10.	10.	
2-Chloronaphthalene	91-58-7	<10.	10.	
2-Nitroaniline	88-74-4	<50.	50.	
Dimethylphthalate	131-11-3	<10.	10.	
Acenaphthylene	208-96-8	<10.	10.	
2,6-Dinitrotoluene	606-20-2	<10.	10.	
3-Nitroaniline	99-09-2	<50.	50.	
Acenaphthene	83-32-9	<10.	10.	
2,4-Dinitrophenol	51-28-5	<50.	50.	
4-Nitrophenol	100-02-7	<50.	50.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
0 SEMI-VOLATILES

Client Sample ID:	D8-48	LAL Sample ID:	L7305-106
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	<10.	10.	
2,4-Dinitrotoluene	121-14-2	<10.	10.	
Diethylphthalate	84-66-2	<10.	10.	
4-Chlorophenyl-phenylether	7005-72-3	<10.	10.	
Fluorene	86-73-7	<10.	10.	
4-Nitroaniline	100-01-6	<20.	20.	
4,6-Dinitro-2-methylphenol	534-52-1	<50.	50.	
N-Nitrosodiphenylamine (1)	86-30-6	<10.	10.	
4-Bromophenyl-phenylether	101-55-3	<10.	10.	
Hexachlorobenzene	118-74-1	<10.	10.	
Pentachlorophenol	87-86-5	<50.	50.	
Phenanthrene	85-01-8	<10.	10.	
Anthracene	120-12-7	<10.	10.	
Carbazole	86-74-8	<10.	10.	
Di-n-butylphthalate	84-74-2	<10.	10.	
Fluoranthene	206-44-0	<10.	10.	
Pyrene	129-00-0	<10.	10.	
Butylbenzylphthalate	85-68-7	<10.	10.	
3,3'-Dichlorobenzidine	91-94-1	<20.	20.	
Benzo(a)anthracene	56-55-3	<10.	10.	
Chrysene	218-01-9	<10.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	<10.	10.	
Di-n-octylphthalate	117-84-0	<10.	10.	
Benzo(b)fluoranthene	205-99-2	<10.	10.	
Benzo(k)fluoranthene	207-08-9	<10.	10.	
Benzo(a)pyrene	50-32-8	<10.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	<10.	10.	
Dibenz(a,h)anthracene	53-70-3	<10.	10.	
Benzo(g,h,i)perylene	191-24-2	<10.	10.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
0 SEMI-VOLATILES

Client Sample ID:	C6-R04	LAL Sample ID:	L7305-107
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	67%	31-110
Phenol-d5	75%	27-111
Nitrobenzene-d5	70%	40-114
2-Fluorobiphenyl	55%	41-111
2,4,6-Tribromophenol	79%	34-147
Terphenyl-d14	44%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	<10.	10.	
bis(2-Chloroethyl)ether	111-44-4	<10.	10.	
2-Chlorophenol	95-57-8	<10.	10.	
1,3-Dichlorobenzene	541-73-1	<10.	10.	
1,4-Dichlorobenzene	106-46-7	<10.	10.	
Benzyl alcohol	100-51-6	<20.	20.	
1,2-Dichlorobenzene	95-50-1	<10.	10.	
2-Methylphenol	95-48-7	<10.	10.	
bis(2-chloroisopropyl)ether	108-60-1	<10.	10.	
4-Methylphenol	106-44-5	<10.	10.	
N-Nitroso-di-n-propylamine	621-64-7	<10.	10.	
Hexachloroethane	67-72-1	<10.	10.	
Nitrobenzene	98-95-3	<10.	10.	
Isophorone	78-59-1	<10.	10.	
2-Nitrophenol	88-75-5	<10.	10.	
2,4-Dimethylphenol	105-67-9	<10.	10.	
Benzoic acid	65-85-0	<50.	50.	
bis(2-Chloroethoxy)methane	111-91-1	<10.	10.	
2,4-Dichlorophenol	120-83-2	<10.	10.	
1,2,4-Trichlorobenzene	120-82-1	<10.	10.	
Naphthalene	91-20-3	<10.	10.	
4-Chloroaniline	106-47-8	<20.	20.	
Hexachlorobutadiene	87-68-3	<10.	10.	
4-Chloro-3-methylphenol	59-50-7	<20.	20.	
2-Methylnaphthalene	91-57-6	<10.	10.	
Hexachlorocyclopentadiene	77-47-4	<10.	10.	
2,4,6-Trichlorophenol	88-06-2	<10.	10.	
2,4,5-Trichlorophenol	95-95-4	<10.	10.	
2-Chloronaphthalene	91-58-7	<10.	10.	
2-Nitroaniline	88-74-4	<50.	50.	
Dimethylphthalate	131-11-3	<10.	10.	
Acenaphthylene	208-96-8	<10.	10.	
2,6-Dinitrotoluene	606-20-2	<10.	10.	
3-Nitroaniline	99-09-2	<50.	50.	
Acenaphthene	83-32-9	<10.	10.	
2,4-Dinitrophenol	51-28-5	<50.	50.	
4-Nitrophenol	100-02-7	<50.	50.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
70 SEMI-VOLATILES

Client Sample ID:	C6-R04	LAL Sample ID:	L7305-107
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	<10.	10.	
2,4-Dinitrotoluene	121-14-2	<10.	10.	
Diethylphthalate	84-66-2	<10.	10.	
4-Chlorophenyl-phenylether	7005-72-3	<10.	10.	
Fluorene	86-73-7	<10.	10.	
4-Nitroaniline	100-01-6	<20.	20.	
4,6-Dinitro-2-methylphenol	534-52-1	<50.	50.	
N-Nitrosodiphenylamine (1)	86-30-6	<10.	10.	
4-Bromophenyl-phenylether	101-55-3	<10.	10.	
Hexachlorobenzene	118-74-1	<10.	10.	
Pentachlorophenol	87-86-5	<50.	50.	
Phenanthrene	85-01-8	<10.	10.	
Anthracene	120-12-7	<10.	10.	
Carbazole	86-74-8	<10.	10.	
Di-n-butylphthalate	84-74-2	<10.	10.	
Fluoranthene	206-44-0	<10.	10.	
Pyrene	129-00-0	<10.	10.	
Butylbenzylphthalate	85-68-7	<10.	10.	
3,3'-Dichlorobenzidine	91-94-1	<20.	20.	
Benzo(a)anthracene	56-55-3	<10.	10.	
Chrysene	218-01-9	<10.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	<10.	10.	
Di-n-octylphthalate	117-84-0	<10.	10.	
Benzo(b)fluoranthene	205-99-2	<10.	10.	
Benzo(k)fluoranthene	207-08-9	<10.	10.	
Benzo(a)pyrene	50-32-8	<10.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	<10.	10.	
Dibenz(a,h)anthracene	53-70-3	<10.	10.	
Benzo(g,h,i)perylene	191-24-2	<10.	10.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
[illegible]0 SEMI-VOLATILES

Client Sample ID:	D6-R34	LAL Sample ID:	L7305-110
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070396-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.10

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	49%	31-110
Phenol-d5	65%	27-111
Nitrobenzene-d5	79%	40-114
2-Fluorobiphenyl	66%	41-111
2,4,6-Tribromophenol	79%	34-147
Terphenyl-d14	97%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	<11.	11.	
bis(2-Chloroethyl)ether	111-44-4	<11.	11.	
2-Chlorophenol	95-57-8	<11.	11.	
1,3-Dichlorobenzene	541-73-1	<11.	11.	
1,4-Dichlorobenzene	106-46-7	<11.	11.	
Benzyl alcohol	100-51-6	<22.	22.	
1,2-Dichlorobenzene	95-50-1	<11.	11.	
2-Methylphenol	95-48-7	<11.	11.	
bis(2-chloroisopropyl)ether	108-60-1	<11.	11.	
4-Methylphenol	106-44-5	<11.	11.	
N-Nitroso-di-n-propylamine	621-64-7	<11.	11.	
Hexachloroethane	67-72-1	<11.	11.	
Nitrobenzene	98-95-3	<11.	11.	
Isophorone	78-59-1	<11.	11.	
2-Nitrophenol	88-75-5	<11.	11.	
2,4-Dimethylphenol	105-67-9	<11.	11.	
Benzoic acid	65-85-0	<55.	55.	
bis(2-Chloroethoxy)methane	111-91-1	<11.	11.	
2,4-Dichlorophenol	120-83-2	<11.	11.	
1,2,4-Trichlorobenzene	120-82-1	<11.	11.	
Naphthalene	91-20-3	18.	11.	
4-Chloroaniline	106-47-8	<22.	22.	
Hexachlorobutadiene	87-68-3	<11.	11.	
4-Chloro-3-methylphenol	59-50-7	<22.	22.	
2-Methylnaphthalene	91-57-6	20.	11.	
Hexachlorocyclopentadiene	77-47-4	<11.	11.	
2,4,6-Trichlorophenol	88-06-2	<11.	11.	
2,4,5-Trichlorophenol	95-95-4	<11.	11.	
2-Chloronaphthalene	91-58-7	<11.	11.	
2-Nitroaniline	88-74-4	<55.	55.	
Dimethylphthalate	131-11-3	<11.	11.	
Acenaphthylene	208-96-8	<11.	11.	
2,6-Dinitrotoluene	606-20-2	<11.	11.	
3-Nitroaniline	99-09-2	<55.	55.	
Acenaphthene	83-32-9	3.4	11.	J
2,4-Dinitrophenol	51-28-5	<55.	55.	
4-Nitrophenol	100-02-7	<55.	55.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
8270 SEMI-VOLATILES

Client Sample ID:	D6-R34	LAL Sample ID:	L7305-110
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070396-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.10

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	<11.	11.	
2,4-Dinitrotoluene	121-14-2	<11.	11.	
Diethylphthalate	84-66-2	<11.	11.	
4-Chlorophenyl-phenylether	7005-72-3	<11.	11.	
Fluorene	86-73-7	<11.	11.	
4-Nitroaniline	100-01-6	<22.	22.	
4,6-Dinitro-2-methylphenol	534-52-1	<55.	55.	
N-Nitrosodiphenylamine (1)	86-30-6	<11.	11.	
4-Bromophenyl-phenylether	101-55-3	<11.	11.	
Hexachlorobenzene	118-74-1	<11.	11.	
Pentachlorophenol	87-86-5	<55.	55.	
Phenanthrene	85-01-8	<11.	11.	
Anthracene	120-12-7	<11.	11.	
Carbazole	86-74-8	<11.	11.	
Di-n-butylphthalate	84-74-2	<11.	11.	
Fluoranthene	206-44-0	<11.	11.	
Pyrene	129-00-0	<11.	11.	
Butylbenzylphthalate	85-68-7	<11.	11.	
3,3'-Dichlorobenzidine	91-94-1	<22.	22.	
Benzo(a)anthracene	56-55-3	<11.	11.	
Chrysene	218-01-9	<11.	11.	
bis(2-Ethylhexyl)phthalate	117-81-7	340	11.	E
Di-n-octylphthalate	117-84-0	<11.	11.	
Benzo(b)fluoranthene	205-99-2	<11.	11.	
Benzo(k)fluoranthene	207-08-9	<11.	11.	
Benzo(a)pyrene	50-32-8	<11.	11.	
Indeno(1,2,3-cd)pyrene	193-39-5	<11.	11.	
Dibenz(a,h)anthracene	53-70-3	<11.	11.	
Benzo(g,h,i)perylene	191-24-2	<11.	11.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
) SEMI-VOLATILES

Client Sample ID:	D7-34	LAL Sample ID:	L7305-111
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070396-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	14% *	31-110
Phenol-d5	50%	27-111
Nitrobenzene-d5	65%	40-114
2-Fluorobiphenyl	55%	41-111
2,4,6-Tribromophenol	45%	34-147
Terphenyl-d14	20% *	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	<10.	10.	
bis(2-Chloroethyl)ether	111-44-4	<10.	10.	
2-Chlorophenol	95-57-8	<10.	10.	
1,3-Dichlorobenzene	541-73-1	<10.	10.	
1,4-Dichlorobenzene	106-46-7	<10.	10.	
Benzyl alcohol	100-51-6	<20.	20.	
1,2-Dichlorobenzene	95-50-1	<10.	10.	
2-Methylphenol	95-48-7	<10.	10.	
bis(2-chloroisopropyl)ether	108-60-1	<10.	10.	
4-Methylphenol	106-44-5	<10.	10.	
N-Nitroso-di-n-propylamine	621-64-7	<10.	10.	
Hexachloroethane	67-72-1	<10.	10.	
Nitrobenzene	98-95-3	<10.	10.	
Isophorone	78-59-1	<10.	10.	
2-Nitrophenol	88-75-5	<10.	10.	
2,4-Dimethylphenol	105-67-9	<10.	10.	
Benzoic acid	65-85-0	<51.	51.	
bis(2-Chloroethoxy)methane	111-91-1	<10.	10.	
2,4-Dichlorophenol	120-83-2	<10.	10.	
1,2,4-Trichlorobenzene	120-82-1	<10.	10.	
Naphthalene	91-20-3	<10.	10.	
4-Chloroaniline	106-47-8	<20.	20.	
Hexachlorobutadiene	87-68-3	<10.	10.	
4-Chloro-3-methylphenol	59-50-7	<20.	20.	
2-Methylnaphthalene	91-57-6	<10.	10.	
Hexachlorocyclopentadiene	77-47-4	<10.	10.	
2,4,6-Trichlorophenol	88-06-2	<10.	10.	
2,4,5-Trichlorophenol	95-95-4	<10.	10.	
2-Chloronaphthalene	91-58-7	<10.	10.	
2-Nitroaniline	88-74-4	<51.	51.	
Dimethylphthalate	131-11-3	<10.	10.	
Acenaphthylene	208-96-8	<10.	10.	
2,6-Dinitrotoluene	606-20-2	<10.	10.	
3-Nitroaniline	99-09-2	<51.	51.	
Acenaphthene	83-32-9	<10.	10.	
2,4-Dinitrophenol	51-28-5	<51.	51.	
4-Nitrophenol	100-02-7	<51.	51.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
8270 SEMI-VOLATILES

Client Sample ID:	D7-34	LAL Sample ID:	L7305-111
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070396-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.01

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	<10.	10.	
2,4-Dinitrotoluene	121-14-2	<10.	10.	
Diethylphthalate	84-66-2	<10.	10.	
4-Chlorophenyl-phenylether	7005-72-3	<10.	10.	
Fluorene	86-73-7	<10.	10.	
4-Nitroaniline	100-01-6	<20.	20.	
4,6-Dinitro-2-methylphenol	534-52-1	<51.	51.	
N-Nitrosodiphenylamine (1)	86-30-6	<10.	10.	
4-Bromophenyl-phenylether	101-55-3	<10.	10.	
Hexachlorobenzene	118-74-1	<10.	10.	
Pentachlorophenol	87-86-5	<51.	51.	
Phenanthrene	85-01-8	<10.	10.	
Anthracene	120-12-7	<10.	10.	
Carbazole	86-74-8	<10.	10.	
Di-n-butylphthalate	84-74-2	<10.	10.	
Fluoranthene	206-44-0	<10.	10.	
Pyrene	129-00-0	<10.	10.	
Butylbenzylphthalate	85-68-7	<10.	10.	
3,3'-Dichlorobenzidine	91-94-1	<20.	20.	
Benzo(a)anthracene	56-55-3	<10.	10.	
Chrysene	218-01-9	<10.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	<10.	10.	
Di-n-octylphthalate	117-84-0	<10.	10.	
Benzo(b)fluoranthene	205-99-2	<10.	10.	
Benzo(k)fluoranthene	207-08-9	<10.	10.	
Benzo(a)pyrene	50-32-8	<10.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	<10.	10.	
Dibenz(a,h)anthracene	53-70-3	<10.	10.	
Benzo(g,h,i)perylene	191-24-2	<10.	10.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
0 SEMI-VOLATILES

Client Sample ID:	I3-67	LAL Sample ID:	L7305-112
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	15% *	31-110
Phenol-d5	51%	27-111
Nitrobenzene-d5	67%	40-114
2-Fluorobiphenyl	49%	41-111
2,4,6-Tribromophenol	59%	34-147
Terphenyl-d14	19% *	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	<10.	10.	
bis(2-Chloroethyl)ether	111-44-4	<10.	10.	
2-Chlorophenol	95-57-8	<10.	10.	
1,3-Dichlorobenzene	541-73-1	<10.	10.	
1,4-Dichlorobenzene	106-46-7	<10.	10.	
Benzyl alcohol	100-51-6	<20.	20.	
1,2-Dichlorobenzene	95-50-1	<10.	10.	
2-Methylphenol	95-48-7	<10.	10.	
bis(2-chloroisopropyl)ether	108-60-1	<10.	10.	
4-Methylphenol	106-44-5	<10.	10.	
N-Nitroso-di-n-propylamine	621-64-7	<10.	10.	
Hexachloroethane	67-72-1	<10.	10.	
Nitrobenzene	98-95-3	<10.	10.	
Isophorone	78-59-1	<10.	10.	
2-Nitrophenol	88-75-5	<10.	10.	
2,4-Dimethylphenol	105-67-9	<10.	10.	
Benzoic acid	65-85-0	<50.	50.	
bis(2-Chloroethoxy)methane	111-91-1	<10.	10.	
2,4-Dichlorophenol	120-83-2	<10.	10.	
1,2,4-Trichlorobenzene	120-82-1	<10.	10.	
Naphthalene	91-20-3	<10.	10.	
4-Chloroaniline	106-47-8	<20.	20.	
Hexachlorobutadiene	87-68-3	<10.	10.	
4-Chloro-3-methylphenol	59-50-7	<20.	20.	
2-Methylnaphthalene	91-57-6	<10.	10.	
Hexachlorocyclopentadiene	77-47-4	<10.	10.	
2,4,6-Trichlorophenol	88-06-2	<10.	10.	
2,4,5-Trichlorophenol	95-95-4	<10.	10.	
2-Chloronaphthalene	91-58-7	<10.	10.	
2-Nitroaniline	88-74-4	<50.	50.	
Dimethylphthalate	131-11-3	<10.	10.	
Acenaphthylene	208-96-8	<10.	10.	
2,6-Dinitrotoluene	606-20-2	<10.	10.	
3-Nitroaniline	99-09-2	<50.	50.	
Acenaphthene	83-32-9	<10.	10.	
2,4-Dinitrophenol	51-28-5	<50.	50.	
4-Nitrophenol	100-02-7	<50.	50.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
) SEMI-VOLATILES

Client Sample ID:	I3-67	LAL Sample ID:	L7305-112
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	<10.	10.	
2,4-Dinitrotoluene	121-14-2	<10.	10.	
Diethylphthalate	84-66-2	<10.	10.	
4-Chlorophenyl-phenylether	7005-72-3	<10.	10.	
Fluorene	86-73-7	<10.	10.	
4-Nitroaniline	100-01-6	<20.	20.	
4,6-Dinitro-2-methylphenol	534-52-1	<50.	50.	
N-Nitrosodiphenylamine (1)	86-30-6	<10.	10.	
4-Bromophenyl-phenylether	101-55-3	<10.	10.	
Hexachlorobenzene	118-74-1	<10.	10.	
Pentachlorophenol	87-86-5	<50.	50.	
Phenanthrene	85-01-8	<10.	10.	
Anthracene	120-12-7	<10.	10.	
Carbazole	86-74-8	<10.	10.	
Di-n-butylphthalate	84-74-2	<10.	10.	
Fluoranthene	206-44-0	<10.	10.	
Pyrene	129-00-0	<10.	10.	
Butylbenzylphthalate	85-68-7	<10.	10.	
3,3'-Dichlorobenzidine	91-94-1	<20.	20.	
Benzo(a)anthracene	56-55-3	<10.	10.	
Chrysene	218-01-9	<10.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	<10.	10.	
Di-n-octylphthalate	117-84-0	<10.	10.	
Benzo(b)fluoranthene	205-99-2	<10.	10.	
Benzo(k)fluoranthene	207-08-9	<10.	10.	
Benzo(a)pyrene	50-32-8	<10.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	<10.	10.	
Dibenz(a,h)anthracene	53-70-3	<10.	10.	
Benzo(g,h,i)perylene	191-24-2	<10.	10.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
0 SEMI-VOLATILES

Client Sample ID:	I3-67	LAL Sample ID:	L7305-112
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070396-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	12% *	31-110
Phenol-d5	33%	27-111
Nitrobenzene-d5	62%	40-114
2-Fluorobiphenyl	51%	41-111
2,4,6-Tribromophenol	40%	34-147
Terphenyl-d14	85%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	<10.	10.	
bis(2-Chloroethyl)ether	111-44-4	<10.	10.	
2-Chlorophenol	95-57-8	<10.	10.	
1,3-Dichlorobenzene	541-73-1	<10.	10.	
1,4-Dichlorobenzene	106-46-7	<10.	10.	
Benzyl alcohol	100-51-6	<20.	20.	
1,2-Dichlorobenzene	95-50-1	<10.	10.	
2-Methylphenol	95-48-7	<10.	10.	
bis(2-chloroisopropyl)ether	108-60-1	<10.	10.	
4-Methylphenol	106-44-5	<10.	10.	
N-Nitroso-di-n-propylamine	621-64-7	<10.	10.	
Hexachloroethane	67-72-1	<10.	10.	
Nitrobenzene	98-95-3	<10.	10.	
Isophorone	78-59-1	<10.	10.	
2-Nitrophenol	88-75-5	<10.	10.	
2,4-Dimethylphenol	105-67-9	<10.	10.	
Benzoic acid	65-85-0	<50.	50.	
bis(2-Chloroethoxy)methane	111-91-1	<10.	10.	
2,4-Dichlorophenol	120-83-2	<10.	10.	
1,2,4-Trichlorobenzene	120-82-1	<10.	10.	
Naphthalene	91-20-3	<10.	10.	
4-Chloroaniline	106-47-8	<20.	20.	
Hexachlorobutadiene	87-68-3	<10.	10.	
4-Chloro-3-methylphenol	59-50-7	<20.	20.	
2-Methylnaphthalene	91-57-6	<10.	10.	
Hexachlorocyclopentadiene	77-47-4	<10.	10.	
2,4,6-Trichlorophenol	88-06-2	<10.	10.	
2,4,5-Trichlorophenol	95-95-4	<10.	10.	
2-Chloronaphthalene	91-58-7	<10.	10.	
2-Nitroaniline	88-74-4	<50.	50.	
Dimethylphthalate	131-11-3	<10.	10.	
Acenaphthylene	208-96-8	<10.	10.	
2,6-Dinitrotoluene	606-20-2	<10.	10.	
3-Nitroaniline	99-09-2	<50.	50.	
Acenaphthene	83-32-9	<10.	10.	
2,4-Dinitrophenol	51-28-5	<50.	50.	
4-Nitrophenol	100-02-7	<50.	50.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
8270 SEMI-VOLATILES

Client Sample ID:	I3-67	LAL Sample ID:	L7305-112
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070396-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	<10.	10.	
2,4-Dinitrotoluene	121-14-2	<10.	10.	
Diethylphthalate	84-66-2	<10.	10.	
4-Chlorophenyl-phenylether	7005-72-3	<10.	10.	
Fluorene	86-73-7	<10.	10.	
4-Nitroaniline	100-01-6	<20.	20.	
4,6-Dinitro-2-methylphenol	534-52-1	<50.	50.	
N-Nitrosodiphenylamine (1)	86-30-6	<10.	10.	
4-Bromophenyl-phenylether	101-55-3	<10.	10.	
Hexachlorobenzene	118-74-1	<10.	10.	
Pentachlorophenol	87-86-5	<50.	50.	
Phenanthrene	85-01-8	<10.	10.	
Anthracene	120-12-7	<10.	10.	
Carbazole	86-74-8	<10.	10.	
Di-n-butylphthalate	84-74-2	<10.	10.	
Fluoranthene	206-44-0	<10.	10.	
Pyrene	129-00-0	<10.	10.	
Butylbenzylphthalate	85-68-7	<10.	10.	
3,3'-Dichlorobenzidine	91-94-1	<20.	20.	
Benzo(a)anthracene	56-55-3	<10.	10.	
Chrysene	218-01-9	<10.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	4.7	10.	J
Di-n-octylphthalate	117-84-0	<10.	10.	
Benzo(b)fluoranthene	205-99-2	<10.	10.	
Benzo(k)fluoranthene	207-08-9	<10.	10.	
Benzo(a)pyrene	50-32-8	<10.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	<10.	10.	
Dibenz(a,h)anthracene	53-70-3	<10.	10.	
Benzo(g,h,i)perylene	191-24-2	<10.	10.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Method Blank	LAL Sample ID:	38495MB
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	21% *	31-110
Phenol-d5	30%	27-111
Nitrobenzene-d5	43%	40-114
2-Fluorobiphenyl	41%	41-111
2,4,6-Tribromophenol	45%	34-147
Terphenyl-d14	78%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	<10.	10.	
bis(2-Chloroethyl)ether	111-44-4	<10.	10.	
2-Chlorophenol	95-57-8	<10.	10.	
1,3-Dichlorobenzene	541-73-1	<10.	10.	
1,4-Dichlorobenzene	106-46-7	<10.	10.	
Benzyl alcohol	100-51-6	<20.	20.	
1,2-Dichlorobenzene	95-50-1	<10.	10.	
2-Methylphenol	95-48-7	<10.	10.	
bis(2-chloroisopropyl)ether	108-60-1	<10.	10.	
4-Methylphenol	106-44-5	<10.	10.	
N-Nitroso-di-n-propylamine	621-64-7	<10.	10.	
Hexachloroethane	67-72-1	<10.	10.	
Nitrobenzene	98-95-3	<10.	10.	
Isophorone	78-59-1	<10.	10.	
2-Nitrophenol	88-75-5	<10.	10.	
2,4-Dimethylphenol	105-67-9	<10.	10.	
Benzoic acid	65-85-0	<50.	50.	
bis(2-Chloroethoxy)methane	111-91-1	<10.	10.	
2,4-Dichlorophenol	120-83-2	<10.	10.	
1,2,4-Trichlorobenzene	120-82-1	<10.	10.	
Naphthalene	91-20-3	<10.	10.	
4-Chloroaniline	106-47-8	<20.	20.	
Hexachlorobutadiene	87-68-3	<10.	10.	
4-Chloro-3-methylphenol	59-50-7	<20.	20.	
2-Methylnaphthalene	91-57-6	<10.	10.	
Hexachlorocyclopentadiene	77-47-4	<10.	10.	
2,4,6-Trichlorophenol	88-06-2	<10.	10.	
2,4,5-Trichlorophenol	95-95-4	<10.	10.	
2-Chloronaphthalene	91-58-7	<10.	10.	
2-Nitroaniline	88-74-4	<50.	50.	
Dimethylphthalate	131-11-3	<10.	10.	
Acenaphthylene	208-96-8	<10.	10.	
2,6-Dinitrotoluene	606-20-2	<10.	10.	
3-Nitroaniline	99-09-2	<50.	50.	
Acenaphthene	83-32-9	<10.	10.	
2,4-Dinitrophenol	51-28-5	<50.	50.	
4-Nitrophenol	100-02-7	<50.	50.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Method Blank	LAL Sample ID:	38495MB
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	<10.	10.	
2,4-Dinitrotoluene	121-14-2	<10.	10.	
Diethylphthalate	84-66-2	<10.	10.	
4-Chlorophenyl-phenylether	7005-72-3	<10.	10.	
Fluorene	86-73-7	<10.	10.	
4-Nitroaniline	100-01-6	<20.	20.	
4,6-Dinitro-2-methylphenol	534-52-1	<50.	50.	
N-Nitrosodiphenylamine (1)	86-30-6	<10.	10.	
4-Bromophenyl-phenylether	101-55-3	<10.	10.	
Hexachlorobenzene	118-74-1	<10.	10.	
Pentachlorophenol	87-86-5	<50.	50.	
Phenanthrene	85-01-8	<10.	10.	
Anthracene	120-12-7	<10.	10.	
Carbazole	86-74-8	<10.	10.	
Di-n-butylphthalate	84-74-2	<10.	10.	
Fluoranthene	206-44-0	<10.	10.	
Pyrene	129-00-0	<10.	10.	
Butylbenzylphthalate	85-68-7	<10.	10.	
3,3'-Dichlorobenzidine	91-94-1	<20.	20.	
Benzo(a)anthracene	56-55-3	<10.	10.	
Chrysene	218-01-9	<10.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	<10.	10.	
Di-n-octylphthalate	117-84-0	<10.	10.	
Benzo(b)fluoranthene	205-99-2	<10.	10.	
Benzo(k)fluoranthene	207-08-9	<10.	10.	
Benzo(a)pyrene	50-32-8	<10.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	<10.	10.	
Dibenz(a,h)anthracene	53-70-3	<10.	10.	
Benzo(g,h,i)perylene	191-24-2	<10.	10.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Method Blank	LAL Sample ID:	38495MB
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	03-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070396-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	20% *	31-110
Phenol-d5	29%	27-111
Nitrobenzene-d5	46%	40-114
2-Fluorobiphenyl	44%	41-111
2,4,6-Tribromophenol	38%	34-147
Terphenyl-d14	110%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	<10.	10.	
bis(2-Chloroethyl)ether	111-44-4	<10.	10.	
2-Chlorophenol	95-57-8	<10.	10.	
1,3-Dichlorobenzene	541-73-1	<10.	10.	
1,4-Dichlorobenzene	106-46-7	<10.	10.	
Benzyl alcohol	100-51-6	<20.	20.	
1,2-Dichlorobenzene	95-50-1	<10.	10.	
2-Methylphenol	95-48-7	<10.	10.	
bis(2-chloroisopropyl)ether	108-60-1	<10.	10.	
4-Methylphenol	106-44-5	<10.	10.	
N-Nitroso-di-n-propylamine	621-64-7	<10.	10.	
Hexachloroethane	67-72-1	<10.	10.	
Nitrobenzene	98-95-3	<10.	10.	
Isophorone	78-59-1	<10.	10.	
2-Nitrophenol	88-75-5	<10.	10.	
2,4-Dimethylphenol	105-67-9	<10.	10.	
Benzoic acid	65-85-0	<50.	50.	
bis(2-Chloroethoxy)methane	111-91-1	<10.	10.	
2,4-Dichlorophenol	120-83-2	<10.	10.	
1,2,4-Trichlorobenzene	120-82-1	<10.	10.	
Naphthalene	91-20-3	<10.	10.	
4-Chloroaniline	106-47-8	<20.	20.	
Hexachlorobutadiene	87-68-3	<10.	10.	
4-Chloro-3-methylphenol	59-50-7	<20.	20.	
2-Methylnaphthalene	91-57-6	<10.	10.	
Hexachlorocyclopentadiene	77-47-4	<10.	10.	
2,4,6-Trichlorophenol	88-06-2	<10.	10.	
2,4,5-Trichlorophenol	95-95-4	<10.	10.	
2-Chloronaphthalene	91-58-7	<10.	10.	
2-Nitroaniline	88-74-4	<50.	50.	
Dimethylphthalate	131-11-3	<10.	10.	
Acenaphthylene	208-96-8	<10.	10.	
2,6-Dinitrotoluene	606-20-2	<10.	10.	
3-Nitroaniline	99-09-2	<50.	50.	
Acenaphthene	83-32-9	<10.	10.	
2,4-Dinitrophenol	51-28-5	<50.	50.	
4-Nitrophenol	100-02-7	<50.	50.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Method Blank	LAL Sample ID:	38495MB
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	03-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070396-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	<10.	10.	
2,4-Dinitrotoluene	121-14-2	<10.	10.	
Diethylphthalate	84-66-2	<10.	10.	
4-Chlorophenyl-phenylether	7005-72-3	<10.	10.	
Fluorene	86-73-7	<10.	10.	
4-Nitroaniline	100-01-6	<20.	20.	
4,6-Dinitro-2-methylphenol	534-52-1	<50.	50.	
N-Nitrosodiphenylamine (1)	86-30-6	<10.	10.	
4-Bromophenyl-phenylether	101-55-3	<10.	10.	
Hexachlorobenzene	118-74-1	<10.	10.	
Pentachlorophenol	87-86-5	<50.	50.	
Phenanthrene	85-01-8	<10.	10.	
Anthracene	120-12-7	<10.	10.	
Carbazole	86-74-8	<10.	10.	
Di-n-butylphthalate	84-74-2	<10.	10.	
Fluoranthene	206-44-0	<10.	10.	
Pyrene	129-00-0	<10.	10.	
Butylbenzylphthalate	85-68-7	<10.	10.	
3,3'-Dichlorobenzidine	91-94-1	<20.	20.	
Benzo(a)anthracene	56-55-3	<10.	10.	
Chrysene	218-01-9	<10.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	<10.	10.	
Di-n-octylphthalate	117-84-0	<10.	10.	
Benzo(b)fluoranthene	205-99-2	<10.	10.	
Benzo(k)fluoranthene	207-08-9	<10.	10.	
Benzo(a)pyrene	50-32-8	<10.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	<10.	10.	
Dibenz(a,h)anthracene	53-70-3	<10.	10.	
Benzo(g,h,i)perylene	191-24-2	<10.	10.	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	C6-RO4	LAL Sample ID:	38495MS
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	55%	31-110
Phenol-d5	66%	27-111
Nitrobenzene-d5	62%	40-114
2-Fluorobiphenyl	62%	41-111
2,4,6-Tribromophenol	88%	34-147
Terphenyl-d14	41%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	74.	10.	
bis(2-Chloroethyl)ether	111-44-4	55.	10.	
2-Chlorophenol	95-57-8	60.	10.	
1,3-Dichlorobenzene	541-73-1	25.	10.	
1,4-Dichlorobenzene	106-46-7	25.	10.	
Benzyl alcohol	100-51-6	64.	20.	
1,2-Dichlorobenzene	95-50-1	27.	10.	
2-Methylphenol	95-48-7	65.	10.	
bis(2-chloroisopropyl)ether	108-60-1	40.	10.	
4-Methylphenol	106-44-5	71.	10.	
N-Nitroso-di-n-propylamine	621-64-7	61.	10.	
Hexachloroethane	67-72-1	24.	10.	
Nitrobenzene	98-95-3	60.	10.	
Isophorone	78-59-1	72.	10.	
2-Nitrophenol	88-75-5	51.	10.	
2,4-Dimethylphenol	105-67-9	73.	10.	
Benzoic acid	65-85-0	84.	51.	
bis(2-Chloroethoxy)methane	111-91-1	67.	10.	
2,4-Dichlorophenol	120-83-2	71.	10.	
1,2,4-Trichlorobenzene	120-82-1	33.	10.	
Naphthalene	91-20-3	39.	10.	
4-Chloroaniline	106-47-8	84.	20.	
Hexachlorobutadiene	87-68-3	27.	10.	
4-Chloro-3-methylphenol	59-50-7	78.	20.	
2-Methylnaphthalene	91-57-6	54.	10.	
Hexachlorocyclopentadiene	77-47-4	3.2	10.	J
2,4,6-Trichlorophenol	88-06-2	77.	10.	
2,4,5-Trichlorophenol	95-95-4	75.	10.	
2-Chloronaphthalene	91-58-7	63.	10.	
2-Nitroaniline	88-74-4	88.	51.	
Dimethylphthalate	131-11-3	76.	10.	
Acenaphthylene	208-96-8	73.	10.	
2,6-Dinitrotoluene	606-20-2	82.	10.	
3-Nitroaniline	99-09-2	82.	51.	
Acenaphthene	83-32-9	71.	10.	
2,4-Dinitrophenol	51-28-5	89.	51.	
4-Nitrophenol	100-02-7	93.	51.	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	C6-RO4	LAL Sample ID:	38495MS
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.01

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	78.	10.	
2,4-Dinitrotoluene	121-14-2	90.	10.	
Diethylphthalate	84-66-2	80.	10.	
4-Chlorophenyl-phenylether	7005-72-3	73.	10.	
Fluorene	86-73-7	79.	10.	
4-Nitroaniline	100-01-6	96.	20.	
4,6-Dinitro-2-methylphenol	534-52-1	93.	51.	
N-Nitrosodiphenylamine (1)	86-30-6	68.	10.	
4-Bromophenyl-phenylether	101-55-3	63.	10.	
Hexachlorobenzene	118-74-1	74.	10.	
Pentachlorophenol	87-86-5	87.	51.	
Phenanthrene	85-01-8	76.	10.	
Anthracene	120-12-7	78.	10.	
Carbazole	86-74-8	88.	10.	
Di-n-butylphthalate	84-74-2	74.	10.	
Fluoranthene	206-44-0	82.	10.	
Pyrene	129-00-0	73.	10.	
Butylbenzylphthalate	85-68-7	74.	10.	
3,3'-Dichlorobenzidine	91-94-1	67.	20.	
Benzo(a)anthracene	56-55-3	74.	10.	
Chrysene	218-01-9	77.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	89.	10.	
Di-n-octylphthalate	117-84-0	74.	10.	
Benzo(b)fluoranthene	205-99-2	70.	10.	
Benzo(k)fluoranthene	207-08-9	70.	10.	
Benzo(a)pyrene	50-32-8	71.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	74.	10.	
Dibenz(a,h)anthracene	53-70-3	76.	10.	
Benzo(g,h,i)perylene	191-24-2	77.	10.	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	C6-RO4	LAL Sample ID:	38495MSD
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	57%	31-110
Phenol-d5	90%	27-111
Nitrobenzene-d5	89%	40-114
2-Fluorobiphenyl	78%	41-111
2,4,6-Tribromophenol	100%	34-147
Terphenyl-d14	61%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	100	10.	
bis(2-Chloroethyl)ether	111-44-4	79.	10.	
2-Chlorophenol	95-57-8	80.	10.	
1,3-Dichlorobenzene	541-73-1	36.	10.	
1,4-Dichlorobenzene	106-46-7	36.	10.	
Benzyl alcohol	100-51-6	99.	20.	
1,2-Dichlorobenzene	95-50-1	39.	10.	
2-Methylphenol	95-48-7	99.	10.	
bis(2-chloroisopropyl)ether	108-60-1	57.	10.	
4-Methylphenol	106-44-5	110	10.	
N-Nitroso-di-n-propylamine	621-64-7	93.	10.	
Hexachloroethane	67-72-1	37.	10.	
Nitrobenzene	98-95-3	83.	10.	
Isophorone	78-59-1	100	10.	
2-Nitrophenol	88-75-5	65.	10.	
2,4-Dimethylphenol	105-67-9	100	10.	
Benzoic acid	65-85-0	99.	51.	
bis(2-Chloroethoxy)methane	111-91-1	94.	10.	
2,4-Dichlorophenol	120-83-2	87.	10.	
1,2,4-Trichlorobenzene	120-82-1	46.	10.	
Naphthalene	91-20-3	55.	10.	
4-Chloroaniline	106-47-8	110	20.	
Hexachlorobutadiene	87-68-3	40.	10.	
4-Chloro-3-methylphenol	59-50-7	100	20.	
2-Methylnaphthalene	91-57-6	73.	10.	
Hexachlorocyclopentadiene	77-47-4	4.6	10.	J
2,4,6-Trichlorophenol	88-06-2	74.	10.	
2,4,5-Trichlorophenol	95-95-4	85.	10.	
2-Chloronaphthalene	91-58-7	81.	10.	
2-Nitroaniline	88-74-4	110	51.	
Dimethylphthalate	131-11-3	96.	10.	
Acenaphthylene	208-96-8	88.	10.	
2,6-Dinitrotoluene	606-20-2	110	10.	
3-Nitroaniline	99-09-2	94.	51.	
Acenaphthene	83-32-9	88.	10.	
2,4-Dinitrophenol	51-28-5	120	51.	
4-Nitrophenol	100-02-7	94.	51.	

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LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	C6-RO4	LAL Sample ID:	38495MSD
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.01

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	98.	10.	
2,4-Dinitrotoluene	121-14-2	110	10.	
Diethylphthalate	84-66-2	97.	10.	
4-Chlorophenyl-phenylether	7005-72-3	91.	10.	
Fluorene	86-73-7	99.	10.	
4-Nitroaniline	100-01-6	100	20.	
4,6-Dinitro-2-methylphenol	534-52-1	120	51.	
N-Nitrosodiphenylamine (1)	86-30-6	91.	10.	
4-Bromophenyl-phenylether	101-55-3	79.	10.	
Hexachlorobenzene	118-74-1	97.	10.	
Pentachlorophenol	87-86-5	110	51.	
Phenanthrene	85-01-8	97.	10.	
Anthracene	120-12-7	97.	10.	
Carbazole	86-74-8	100	10.	
Di-n-butylphthalate	84-74-2	95.	10.	
Fluoranthene	206-44-0	99.	10.	
Pyrene	129-00-0	88.	10.	
Butylbenzylphthalate	85-68-7	95.	10.	
3,3'-Dichlorobenzidine	91-94-1	58.	20.	
Benzo(a)anthracene	56-55-3	93.	10.	
Chrysene	218-01-9	95.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	100	10.	
Di-n-octylphthalate	117-84-0	95.	10.	
Benzo(b)fluoranthene	205-99-2	89.	10.	
Benzo(k)fluoranthene	207-08-9	88.	10.	
Benzo(a)pyrene	50-32-8	89.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	89.	10.	
Dibenz(a,h)anthracene	53-70-3	91.	10.	
Benzo(g,h,i)perylene	191-24-2	90.	10.	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38495LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	32%	31-110
Phenol-d5	49%	27-111
Nitrobenzene-d5	64%	40-114
2-Fluorobiphenyl	67%	41-111
2,4,6-Tribromophenol	78%	34-147
Terphenyl-d14	88%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	56.	10.	
bis(2-Chloroethyl)ether	111-44-4	56.	10.	
2-Chlorophenol	95-57-8	40.	10.	
1,3-Dichlorobenzene	541-73-1	26.	10.	
1,4-Dichlorobenzene	106-46-7	28.	10.	
Benzyl alcohol	100-51-6	71.	20.	
1,2-Dichlorobenzene	95-50-1	28.	10.	
2-Methylphenol	95-48-7	64.	10.	
bis(2-chloroisopropyl)ether	108-60-1	37.	10.	
4-Methylphenol	106-44-5	66.	10.	
N-Nitroso-di-n-propylamine	621-64-7	71.	10.	
Hexachloroethane	67-72-1	25.	10.	
Nitrobenzene	98-95-3	53.	10.	
Isophorone	78-59-1	81.	10.	
2-Nitrophenol	88-75-5	29.	10.	
2,4-Dimethylphenol	105-67-9	67.	10.	
Benzoic acid	65-85-0	8.1	50.	J
bis(2-Chloroethoxy)methane	111-91-1	68.	10.	
2,4-Dichlorophenol	120-83-2	46.	10.	
1,2,4-Trichlorobenzene	120-82-1	27.	10.	
Naphthalene	91-20-3	31.	10.	
4-Chloroaniline	106-47-8	90.	20.	
Hexachlorobutadiene	87-68-3	25.	10.	
4-Chloro-3-methylphenol	59-50-7	80.	20.	
2-Methylnaphthalene	91-57-6	33.	10.	
Hexachlorocyclopentadiene	77-47-4	<10.	10.	
2,4,6-Trichlorophenol	88-06-2	56.	10.	
2,4,5-Trichlorophenol	95-95-4	58.	10.	
2-Chloronaphthalene	91-58-7	37.	10.	
2-Nitroaniline	88-74-4	92.	50.	
Dimethylphthalate	131-11-3	83.	10.	
Acenaphthylene	208-96-8	52.	10.	
2,6-Dinitrotoluene	606-20-2	85.	10.	
3-Nitroaniline	99-09-2	95.	50.	
Acenaphthene	83-32-9	53.	10.	
2,4-Dinitrophenol	51-28-5	26.	50.	J
4-Nitrophenol	100-02-7	51.	50.	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38495LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	67.	10.	
2,4-Dinitrotoluene	121-14-2	85.	10.	
Diethylphthalate	84-66-2	88.	10.	
4-Chlorophenyl-phenylether	7005-72-3	72.	10.	
Fluorene	86-73-7	77.	10.	
4-Nitroaniline	100-01-6	100	20.	
4,6-Dinitro-2-methylphenol	534-52-1	37.	50.	J
N-Nitrosodiphenylamine (1)	86-30-6	84.	10.	
4-Bromophenyl-phenylether	101-55-3	71.	10.	
Hexachlorobenzene	118-74-1	86.	10.	
Pentachlorophenol	87-86-5	57.	50.	
Phenanthrene	85-01-8	86.	10.	
Anthracene	120-12-7	86.	10.	
Carbazole	86-74-8	95.	10.	
Di-n-butylphthalate	84-74-2	87.	10.	
Fluoranthene	206-44-0	94.	10.	
Pyrene	129-00-0	82.	10.	
Butylbenzylphthalate	85-68-7	84.	10.	
3,3'-Dichlorobenzidine	91-94-1	110	20.	
Benzo(a)anthracene	56-55-3	89.	10.	
Chrysene	218-01-9	88.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	88.	10.	
Di-n-octylphthalate	117-84-0	77.	10.	
Benzo(b)fluoranthene	205-99-2	83.	10.	
Benzo(k)fluoranthene	207-08-9	83.	10.	
Benzo(a)pyrene	50-32-8	86.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	90.	10.	
Dibenz(a,h)anthracene	53-70-3	90.	10.	
Benzo(g,h,i)perylene	191-24-2	93.	10.	

LOCKHEED ANALYTICAL SERVICES

MATRIX SPIKE DATA SUMMARY
SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	C6-RO4	LAL Sample ID:	38495MS
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	55%	31-110
Phenol-d5	66%	27-111
Nitrobenzene-d5	62%	40-114
2-Fluorobiphenyl	62%	41-111
2,4,6-Tribromophenol	88%	34-147
Terphenyl-d14	41%	33-141

Constituent	Spike Added ug/L	Sample Concentration ug/L	MS Concentration ug/L	% Recovery	QC Limits % Recovery
Phenol	101	0.000	74.2	73	11-118
2-Chlorophenol	101	0.000	60.0	59	19-123
1,4-Dichlorobenzene	101	0.000	25.0	25	13-110
N-Nitroso-di-n-propylamine	101	0.000	60.7	60	35-125
1,2,4-Trichlorobenzene	101	0.000	32.6	32	19-113
4-Chloro-3-methylphenol	101	0.000	78.2	77	28-134
Acenaphthene	101	0.000	71.1	70	46-116
4-Nitrophenol	101	0.000	92.8	92	10-125
2,4-Dinitrotoluene	101	0.000	89.6	89	33-133
Pentachlorophenol	101	0.000	87.3	86	10-162
Pyrene	101	0.000	72.6	72	60-123

LOCKHEED ANALYTICAL SERVICES

MATRIX SPIKE DUPLICATE DATA SUMMARY
SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	C6-RO4	LAL Sample ID:	38495MSD
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	57%	31-110
Phenol-d5	90%	27-111
Nitrobenzene-d5	89%	40-114
2-Fluorobiphenyl	78%	41-111
2,4,6-Tribromophenol	100%	34-147
Terphenyl-d14	61%	33-141

Constituent	Spike Added ug/L	MSD Concentration ug/L	% Recovery	RPD	QC Limits RPD	QC Limits % Recovery
Phenol	101	102	101	32	42	11-118
2-Chlorophenol	101	80.1	79	29	40	19-123
1,4-Dichlorobenzene	101	36.0	36	36*	28	13-110
N-Nitroso-di-n-propylamine	101	92.6	92	42*	38	35-125
1,2,4-Trichlorobenzene	101	46.1	46	34*	28	19-113
4-Chloro-3-methylphenol	101	104	103	28	42	28-134
Acenaphthene	101	88.1	87	21	31	46-116
4-Nitrophenol	101	94.2	93	1	50	10-125
2,4-Dinitrotoluene	101	114	113	24	38	33-133
Pentachlorophenol	101	105	104	18	50	10-162
Pyrene	101	88.4	88	20	31	60-123

LOCKHEED ANALYTICAL SERVICES

LCS DATA SUMMARY
SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38495LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	32%	31-110
Phenol-d5	49%	27-111
Nitrobenzene-d5	64%	40-114
2-Fluorobiphenyl	67%	41-111
2,4,6-Tribromophenol	78%	34-147
Terphenyl-d14	88%	33-141

Constituent	Spike Added ug/L	LCS Concentration ug/L	LCS % Recovery	QC Limits
Phenol	100	56.0	56	11-118
2-Chlorophenol	100	40.0	40	19-123
1,4-Dichlorobenzene	100	27.6	28	13-110
N-Nitroso-di-n-propylamine	100	70.7	71	35-125
1,2,4-Trichlorobenzene	100	26.6	27	19-113
4-Chloro-3-methylphenol	100	79.9	80	28-134
Acenaphthene	100	52.5	53	46-116
4-Nitrophenol	100	51.2	51	10-125
2,4-Dinitrotoluene	100	84.6	85	33-133
Pentachlorophenol	100	56.8	57	10-162
Pyrene	100	82.4	82	60-123

OCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

strument ID: hpk

Date/Time Analyzed: 02-JUL-96 08:05
LAL Batch ID: 070296-8270-K

		IS1 Area	RT	IS2 Area	RT	IS3 Area	RT
12 HOUR STD		332990	5.530	1044441	6.867	476551	9.378
UPPER LIMIT		665980	6.030	2088882	7.367	953102	9.878
LOWER LIMIT		166495	5.03	522221	6.367	238276	8.878
Client Sample ID	LAL Sample ID						
ethod Blank	38495MB	189767	5.529	611933	6.861	295296	9.375
ab Ctrl Sample	38495LCS	192582	5.531	592817	6.867	285961	9.377
5-RO4	38495MS	217813	5.532	613417	6.859	284133	9.384
5-RO4	38495MSD	289689	5.533	895769	6.862	449250	9.383
2-64	L7305-103	239178	5.530	795070	6.863	443100	9.379
3-50	L7305-105	295114	5.528	941633	6.870	395727	9.386
3-48	L7305-106	225316	5.531	726190	6.864	361844	9.381
5-R04	L7305-107	258352	5.532	819583	6.867	395129	9.378
3-65	L7312-21	321578	5.535	998957	6.863	515119	9.389
3-D2	L7312-23	210905	5.530	686158	6.862	358475	9.387
5-R08	L7312-27	220734	5.533	654036	6.869	317494	9.388
3-67	L7305-112	233140	5.532	722877	6.867	344728	9.381
7-54	L7305-104	375641	5.532	1111901	6.867	526480	9.388
3-48	L7305-106	223633	5.531	645166	6.865	295889	9.381

A UPPER LIMIT = +100% of internal standard area
A LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS1 = 1,4-DICHLOROBENZENE-D4
IS2 = NAPHTHALENE-D8
IS3 = ACENAPHTHENE-D10

OCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

strument ID: hpk

Date/Time Analyzed: 02-JUL-96 08:05
LAL Batch ID: 070296-8270-K

		IS4 Area	RT	IS5 Area	RT	IS6 Area	RT
12 HOUR STD		601023	12.016	377550	17.224	361265	19.859
UPPER LIMIT		1202046	12.516	755100	17.724	722530	20.359
LOWER LIMIT		300512	11.516	188775	16.724	180633	19.359
Client Sample ID	LAL Sample ID						
ethod Blank	38495MB	397284	12.008	256237	17.214	291905	19.856
ab Ctrl Sample	38495LCS	374255	12.015	276481	17.216	300274	19.861
-RO4	38495MS	373841	12.019	276025	17.217	290569	19.855
-RO4	38495MSD	568980	12.018	417115	17.233	449693	19.868
-64	L7305-103	575594	12.017	331290	17.212	342413	19.860
-50	L7305-105	414640	12.021	262552	17.229	275914	19.867
-48	L7305-106	454291	12.015	297512	17.213	303491	19.858
-R04	L7305-107	440616	12.019	286162	17.214	297037	19.861
-65	L7312-21	640282	12.023	388839	17.224	408976	19.863
-D2	L7312-23	489056	12.021	266795	17.217	287387	19.861
-R08	L7312-27	397699	12.021	271260	17.223	276904	19.860
-67	L7305-112	449063	12.021	311914	17.222	353302	19.873
-54	L7305-104	576648	12.022	253478	17.229	251667	19.865
-48	L7305-106	380034	12.024	238076	17.222	250664	19.866

A UPPER LIMIT = +100% of internal standard area
A LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS4 = PHENANTHRENE-D10
IS5 = CHRYSENE-D12
IS6 = PERYLENE-D12

OCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

trument ID: hpk

Date/Time Analyzed: 02-JUL-96 08:05
LAL Batch ID: 070296-8270-K

	IS1 Area	RT	IS2 Area	RT	IS3 Area	RT
12 HOUR STD	332990	5.530	1044441	6.867	476551	9.378
UPPER LIMIT	665980	6.030	2088882	7.367	953102	9.878
LOWER LIMIT	166495	5.03	522221	6.367	238276	8.878

Client Sample ID	LAL Sample ID						

:A UPPER LIMIT = +100% of internal standard area
:A LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS1 = 1,4-DICHLOROBENZENE-D4
IS2 = NAPHTHALENE-D8
IS3 = ACENAPHTHENE-D10

080080

OCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

trument ID: hpk

Date/Time Analyzed: 02-JUL-96 08:05
LAL Batch ID: 070296-8270-K

	IS4 Area	RT	IS5 Area	RT	IS6 Area	RT
12 HOUR STD	601023	12.016	377550	17.224	361265	19.859
UPPER LIMIT	1202046	12.516	755100	17.724	722530	20.359
LOWER LIMIT	300512	11.516	188775	16.724	180633	19.359

Client Sample ID	LAL Sample ID						

A UPPER LIMIT = +100% of internal standard area
A LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS4 = PHENANTHRENE-D10
IS5 = CHRYSENE-D12
IS6 = PERYLENE-D12

180000

...OCKHL... D ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

...trument ID: hpk

Date/Time Analyzed: 03-JUL-96 08:58
LAL Batch ID: 070396-8270-K

		IS1 Area	RT	IS2 Area	RT	IS3 Area	RT
12 HOUR STD		659867	5.523	1913548	6.853	766495	9.368
UPPER LIMIT		1319734	6.023	3827096	7.353	1532990	9.868
LOWER LIMIT		329934	5.023	956774	6.353	383248	8.868
Client Sample ID	LAL Sample ID						
...thod Blank	38495MB	510376	5.520	1609670	6.842	655053	9.366
...-R34	L7305-110	466650	5.523	1324170	6.860	467756	9.374
...-76	L7312-19	626017	5.518	1882166	6.849	776891	9.369
...R08	L7312-27	638477	5.514	1963851	6.850	877943	9.364
...34	L7305-111	566109	5.515	1734585	6.852	702319	9.360
...67	L7305-112	656994	5.523	1951963	6.847	845112	9.365

...UPPER LIMIT = +100% of internal standard area
...LOWER LIMIT = -50% of internal standard area
...PPER LIMIT = +0.50 minutes of internal standard RT
...OWER LIMIT = -0.50 minutes of internal standard RT

IS1 = 1,4-DICHLOROBENZENE-D4
IS2 = NAPHTHALENE-D8
IS3 = ACENAPHTHENE-D10

OCKHE_D ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

trument ID: hpk

Date/Time Analyzed: 03-JUL-96 08:58
LAL Batch ID: 070396-8270-K

		IS4 Area	RT	IS5 Area	RT	IS6 Area	RT
12 HOUR STD		805850	11.999	347447	17.200	293213	19.846
UPPER LIMIT		1611700	12.499	694894	17.700	586426	20.346
LOWER LIMIT		402925	11.499	173724	16.700	146607	19.346
Client Sample ID	LAL Sample ID						
thod Blank	38495MB	691491	11.998	239481	17.192	233107	19.834
-R34	L7305-110	445797	12.016	228790	17.205	236333	19.850
-76	L7312-19	772413	12.005	349425	17.200	340168	19.842
-R08	L7312-27	942229	11.996	395306	17.200	406272	19.838
34	L7305-111	652087	11.995	305403	17.204	312671	19.848
67	L7305-112	781711	12.003	378424	17.195	348901	19.846

. UPPER LIMIT = +100% of internal standard area
. LOWER LIMIT = -50% of internal standard area
PPER LIMIT = +0.50 minutes of internal standard RT
OWER LIMIT = -0.50 minutes of internal standard RT

IS4 = PHENANTHRENE-D10
IS5 = CHRYSENE-D12
IS6 = PERYLENE-D12

000083

RUN LOGS/EXTRACTION SHEETS

INSTRUMENT ID GC-MS X OR L LOGBOOK# LAL-96-LOG-0900 PAGE # 000023

DATE OF INJ.	TIME OF INJ.	LAS LE ID	DESCRIPTION/ CLIENT SAMPLE ID	SOLUTION ID	MATRIX/ DILUTION	DATA FILE	B/)	METHOD FILE	TAPE ID	DR?	COMMENTS
29	1807	L7337-1	BLD69085.CB1-50	0339-36-3		S9901019	KJun1096	K8240tclp.m		DNR	
	1844	L7337-1				S0001020				OK	
	1913	L7337-2	BLD69085.CB2-25			S2101021				DNR	
	1946	L7337-2	BLD69085.CB2-25			S2701022				OK	
	2018	L7337-3	BLD69085.CB3-25			S2301023				DNR	
	2047	L7337-3	BLD69085.CB3-25			S2701024				OK	
	2120	L7337-3		N/A		S2501025				DNR	
	2152	blank				S2601026					
	2224		N/A			S2401027					
	2256					S2801028					
	2329					S2901029					
	0001					S3001030					
	0033					S3101031					
	0105					S3201032					
11	1015		DFTPP + 4 50ng Tune	0339-32-7 0339-36-3		S0101001	KJun1096	K8270tclpp		OK	
	MS		S6TD0701096K	0339-34-2		S0290102		K8240tclp.m		DNR	
	1501	blank		0339-36-3		S0301003				DNR	
	1527		IC160701096K	0339-34-5 0339-36-3		S0401004				OK	
	16360	1559	IC120701096K	-4		S0501005					good 8270 Spt Calibration 7/2/96 cp
	1631		IC080701096K	-3		S0601006					
	1703		IC050701096K	-2		S0701007					
	1736		IC020701096K	-1		S0801008					
	1808	blank		0339-36-3		S0901009				DNR	
12	0753		DFTPP + 4 50ng Tune	0339-32-7 0339-34-2 0339-36-3		S0101001	KJun1096	K8270tclpp.m		OK	
	0805		S6TD0702096K			S0201002		K8270tclp.m		OK	
	0838	L7337-1	BLD69085.CB1-50	0339-36-3		S0301003				DNR	
	0912	38515MSD				S0401004				DNR	
0945	1046	38495MS	blank			S0501005				Rep	w/38495MS ~ 07J396-8270-K
1014	1146	38495CS	LCS			S0601006				OK	
	1146	38495MS	CL-R04			S0701007				OK	

Reportable? (DR?) Column: DNR = Do Not Report; Rep = Report (QC failure, report with another analysis); OK = Report (No QC failure)

ANALYTICAL SERVICES REVIEWED BY _____ INSTRUMENT ID GC-MS VOA1 LOGBOOK# LAL-90-LOG-0900 PAGE # 000024

DATE OF INJ.	TIME OF INJ.	FILE ID	DESCRIPTION/ CLIENT SAMPLE ID	SOLUTION ID	MATRIX/ DILUTION	DATA FILE	BATCH ID	METHOD FILE	TAPE ID	DR?	COMMENTS
2	1119	38465MSD	C6-R04	0339-36-3		S0501008	Kju10296	K8290tclp.m		OK	
	1154	L7305-103	C3-64			S0501009				OK	
	1224	L7305-104	C7-54			S1001010				OK	
	1254	L7305-105	D8-50 L7305-103 D8-50			S1101011				OK	
	1330	L7305-106	D8-48			S1201012				Rep	w/L7305-106 RE in 070396-8270-K
	1400	L7305-107	C6-R04			S1301013				OK	
	1433	L7305-110	D6-R34			S1401014				DNR	
	1504	L7312-19	C4-76			S1501015				DNR	
	1537	L7312-21	C3-65			S1601016				OK	
	1610	L7312-23	B8-D2			S1701017				OK	
	1641	L7312-27	B5-R08			S1801018				Rep	w/L7312-27 RE in 070396-8270-K
	1714	L7305-111	D7-34			S1901019				Rep	w/L7305-111 RE in 070296-8270-K
	1747	L7305-112	I3-67			S2001020				Rep	w/L7305-112 RE in 070296-8270-K
		L7306-113	D8-50			S2101021					
2	1818	38445LCS RE	LCS			S2101021				DNR	
12	1850	L7305-107 RE	C7-54			S2201022				OK	
12	1922	L7305-106R	D8-48			S2301023				Rep	w/L7305-106 in 070296-8270-K
2	1954	L7305-110	D6-R34			S2401024				DNR	
2	2026	Surr CK	0855-27-2			S2501025				Rep	Reprint to Prep Lab internal use only
12	2058	Spike CK	0855-27-3			S2601026				Rep	
3	0847	Sony DMPP+4		0331-33-7		S0101001	Kju10396	K tentative		OK	
	0858		SSD070396K	0339-34-2 0339-36-3		S0201002		K8240tclp.m		OK	
	0937	38445MBRE	blank	0339-36-3		S0301003				Rep	w 38445MB RE in 070296-8270-K
	1003	L7306-110 RE	D6-R34			S0401004				OK	
	1037	L7312-19 RE	C4-76			S0501005				OK	
	1108	L7312-27 RE	B5-R08			S0601006				Rep	w/L7312-27 in 070396-8270-K
	1139	L7305-111RE	D7-34			S0701007				Rep	w/L7305-111 in 070296-8270-K
	1212	L7305-112 RE	I3-67			S0801008				Rep	w/L7305-112 in 070296-8270-K
	1531	38547MB	blank			S0901009				OK	
	1557	38547LCS	LCS			S1001010				OK	

Reportable? (DR?) Column: DNR = Do Not Report; Rep = Report (QC failure, report with another analysis); OK = Report (No QC failure)

GC/MS SVOA UNIX

FULL MATRIX SPIKE

LOCKHEED ANAL .CAL SERVICES

TRACKING SHEET DATA REPORT (bs08)

EXTRACTION SHEET FOR: 8270 SEMI-VOLATILES Extraction

WORKSHEET NUMBER: 8270 SEMI-VOLATILES_38495

Continuous

HT= 06/27
DUE 07/04

#	QC TYPE	CLIENT ID	DATE COLLECTED	DATE RECEIVED/ CREATED	VOL/WT EXTRACT	WATER SAMPLE pH	SURR ML	MS ML	1ST COOK FINAL VOL MLS	TOTAL VOL ON GPC	2ND COOK FINAL VOL MLS	BROUGHT TO FINAL VOLUME OF	AMT GIVEN TO ANALYST
				VKU 6/27/96					AF 06-28-96				
05-103		C2-64	20-JUN-96	24-JUN-96	1000	7	1ml		0.5ml	N/A	N/A	1ml	~1ml
05-104		C7-54	20-JUN-96	24-JUN-96	1000								
05-105		D8-50	20-JUN-96	24-JUN-96	780								
05-106		D8-48	20-JUN-96	24-JUN-96	1000								
05-107		C6-R04	21-JUN-96	24-JUN-96	1000								
05-110		D6-R34	21-JUN-96	24-JUN-96	910								
05-111		D7-34	21-JUN-96	24-JUN-96	970								
05-112		I3-67	21-JUN-96	24-JUN-96	1000								
12-19		C4-76	24-JUN-96	25-JUN-96	1000								
12-21		C3-65	24-JUN-96	25-JUN-96	1000								
12-23		B8-D2	24-JUN-96	25-JUN-96	1000								
12-27		B5-R08	24-JUN-96	25-JUN-96	1000								
05MB	MB	Method Blank		27-JUN-96	1000								

CONTINUOUS EXTRACTION
EXTRACTION STARTED : 06-27-96
EXTRACTION COMPLETED : 06-29-96
DATE & TIME STARTED (acid): 6-27-96 @ 7:00pm
DATE & TIME COMPLETED (acid): 6/28/96 1pm SP
DATE & TIME STARTED (BN) : 6-28-96 2:10pm SP
DATE & TIME COMPLETED (BN) : 6-29-96 8:10pm MW

SIGNED: Neil Underwood
SIGNED: Anita Fernandez
SPIKED WITNESS: Johnny Lee
SIGNED:

BATCH# : 8270 SEMI-VOLATILES_38495
LOT #'S
SPIKE ID # : 0859-24-3 CONC: 100/150 µg/ml MECL2 : 36073
SURR # : 07666-38-5 CONC: 100 µg/ml ACETONE: N/A NA2SO4 : K05649

REVIEWED BY: Judith Burns 07-01-96

EXTRACT COC: RECIEVED BY: DATE: 7-2-96

INITIAL PH OF ALL SAMPLES ADJUSTED TO <2. VKU 06-27-96
Condensor line was inadvertent pinched when another set of samples was removed at 9AM 6/28/96. All samples went to near dryness in the round bottoms. Samples were cooled at 10:30AM and additional MeCh added & adjusted to >10 w/10N NaOH 6/28/96 SP

SP 6/28/96

LOCKHEED ANALYTICAL SERVICES

TRACKING SHEET DATA REPORT (bs08)

EXTRACTION SHEET FOR: 8270 SEMI-VOLATILES Extraction

WORKSHEET NUMBER: 8270 SEMI-VOLATILES_38495

#	QC TYPE	CLIENT ID	DATE COLLECTED	DATE RECEIVED/ CREATED	VOL/WT EXTR mL	WATER SAMPLE pH	SURR ML	MS ML	1ST COOK FINAL VOL MLS	TOTAL VOL ON GPC	2ND COOK FINAL VOL MLS	BROUGHT TO FINAL VOLUME OF	AMT GIVEN TO ANALYST
95LCS	LCS	Lab Ctrl Sample		27-JUN-96	1000	7	1ml	1ml	0.5ml	N/A	N/A	1 ml	~1 ml
95MS LT305-108	MS	~~MS/MSD~~ C6-R04 PL 7/16/96	21-JUN-96	24-JUN-96	TIC	↓	↓	↓	↓	↓	↓	↓	↓
95MSD LT305-109	MSD	~~MS/MSD~~ C6-R04 ↓	21-JUN-96	24-JUN-96	TIC	↓	↓	↓	↓	↓	↓	↓	↓
~~KELOT38495~~	~~SPIKELOT~~	~~Spike Lot Sample~~		~~27-JUN-96~~							JLB 06-27-96		

INUOUS EXTRACTION
ACTION STARTED : _____ EXTRACTION COMPLETED : _____

& TIME STARTED (acid): _____ DATE & TIME COMPLETED (acid): _____ SIGNED: _____

& TIME STARTED (BN) : _____ DATE & TIME COMPLETED (BN) : _____ SIGNED: _____

ATCH# : 8270 SEMI-VOLATILES_38495 LOT #'S SPIKED WITNESS: _____

ID # : _____ CONC: _____ MECL2 : _____ SIGNED: _____

D # : _____ CONC: _____ ACETONE: _____ NA2SO4 : _____

REVIEWED BY: _____

ATIVE EXTRACT COC: RECIEVED BY: _____ DATE: _____

280000

EPA METHOD 8270
SELECTIVE ION MONITORING

SAMPLE RESULTS FORMS AND QC SUMMARIES

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
SIM

Client Sample ID:	C6-56	LAL Sample ID:	L7305-66
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	26-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	87%	40-114
2-Fluorobiphenyl	73%	41-111
Terphenyl-d14	120%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	<0.40	0.40	
Acenaphthylene	208-96-8	<0.10	0.10	
Acenaphthene	83-32-9	<0.10	0.10	
Fluorene	86-73-7	<0.10	0.10	
Phenanthrene	85-01-8	<0.10	0.10	
Anthracene	120-12-7	<0.10	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	<0.10	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	<0.10	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
SIM

Client Sample ID:	C6-58	LAL Sample ID:	L7305-68
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	26-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	72%	40-114
2-Fluorobiphenyl	67%	41-111
Terphenyl-d14	90%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	<0.40	0.40	
Acenaphthylene	208-96-8	<0.10	0.10	
Acenaphthene	83-32-9	<0.10	0.10	
Fluorene	86-73-7	<0.10	0.10	
Phenanthrene	85-01-8	<0.10	0.10	
Anthracene	120-12-7	<0.10	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	0.17	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	<0.10	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

S[illegible]OAS BY SIM GC/MS
) SIM

Client Sample ID:	A3-62	LAL Sample ID:	L7305-70
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	26-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	84%	40-114
2-Fluorobiphenyl	73%	41-111
Terphenyl-d14	109%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	<0.40	0.40	
Acenaphthylene	208-96-8	<0.10	0.10	
Acenaphthene	83-32-9	<0.10	0.10	
Fluorene	86-73-7	<0.10	0.10	
Phenanthrene	85-01-8	<0.10	0.10	
Anthracene	120-12-7	<0.10	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	<0.10	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	<0.10	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

SW8AS BY SIM GC/MS
0 SIM

Client Sample ID:	C6-R37	LAL Sample ID:	L7305-72
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	26-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	66%	40-114
2-Fluorobiphenyl	60%	41-111
Terphenyl-d14	123%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	<0.40	0.40	
Acenaphthylene	208-96-8	<0.10	0.10	
Acenaphthene	83-32-9	<0.10	0.10	
Fluorene	86-73-7	<0.10	0.10	
Phenanthrene	85-01-8	<0.10	0.10	
Anthracene	120-12-7	<0.10	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	0.12	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	<0.10	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
) SIM

Client Sample ID:	C2-64	LAL Sample ID:	L7305-74
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	26-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	84%	40-114
2-Fluorobiphenyl	70%	41-111
Terphenyl-d14	82%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	<0.40	0.40	
Acenaphthylene	208-96-8	<0.10	0.10	
Acenaphthene	83-32-9	<0.10	0.10	
Fluorene	86-73-7	<0.10	0.10	
Phenanthrene	85-01-8	<0.10	0.10	
Anthracene	120-12-7	<0.10	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	<0.10	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	<0.10	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
& SIM

Client Sample ID:	C7-54	LAL Sample ID:	L7305-76
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	26-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	90%	40-114
2-Fluorobiphenyl	74%	41-111
Terphenyl-d14	103%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	<0.40	0.40	
Acenaphthylene	208-96-8	<0.10	0.10	
Acenaphthene	83-32-9	<0.10	0.10	
Fluorene	86-73-7	<0.10	0.10	
Phenanthrene	85-01-8	<0.10	0.10	
Anthracene	120-12-7	<0.10	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	<0.10	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	<0.10	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
) SIM

Client Sample ID:	D8-50	LAL Sample ID:	L7305-78
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	26-JUN-96
Matrix:	Water	Analytical Batch ID:	070396-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	103%	40-114
2-Fluorobiphenyl	82%	41-111
Terphenyl-d14	75%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	1.5	0.40	
Acenaphthylene	208-96-8	0.26	0.10	
Acenaphthene	83-32-9	0.90	0.10	
Fluorene	86-73-7	1.1	0.10	
Phenanthrene	85-01-8	0.38	0.10	
Anthracene	120-12-7	<0.10	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	<0.10	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	<0.10	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
) SIM

Client Sample ID:	D8-48	LAL Sample ID:	L7305-80
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	26-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	94%	40-114
2-Fluorobiphenyl	75%	41-111
Terphenyl-d14	109%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	<0.40	0.40	
Acenaphthylene	208-96-8	<0.10	0.10	
Acenaphthene	83-32-9	<0.10	0.10	
Fluorene	86-73-7	<0.10	0.10	
Phenanthrene	85-01-8	<0.10	0.10	
Anthracene	120-12-7	<0.10	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	<0.10	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	<0.10	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

[illegible]AS BY SIM GC/MS
) SIM

Client Sample ID:	D7-51	LAL Sample ID:	L7305-82
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	26-JUN-96
Matrix:	Water	Analytical Batch ID:	070396-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	85%	40-114
2-Fluorobiphenyl	81%	41-111
Terphenyl-d14	104%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	<0.40	0.40	
Acenaphthylene	208-96-8	0.15	0.10	
Acenaphthene	83-32-9	0.83	0.10	
Fluorene	86-73-7	0.80	0.10	
Phenanthrene	85-01-8	0.21	0.10	
Anthracene	120-12-7	0.14	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	0.11	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	<0.10	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
) SIM

Client Sample ID:	D7-33	LAL Sample ID:	L7305-84
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	26-JUN-96
Matrix:	Water	Analytical Batch ID:	070396-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	2
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	540% *	40-114
2-Fluorobiphenyl	81%	41-111
Terphenyl-d14	61%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	2.6	0.81	
Acenaphthylene	208-96-8	1.6	0.20	
Acenaphthene	83-32-9	6.0	0.20	
Fluorene	86-73-7	5.2	0.20	
Phenanthrene	85-01-8	3.9	0.20	
Anthracene	120-12-7	2.6	0.20	
Fluoranthene	206-44-0	1.1	0.20	
Pyrene	129-00-0	10.	0.20	
Benzo(a)anthracene	56-55-3	3.0	0.20	
Chrysene	218-01-9	8.8	0.20	
Benzo(b)fluoranthene	205-99-2	2.6	0.20	
Benzo(k)fluoranthene	207-08-9	<0.20	0.20	
Benzo(a)pyrene	50-32-8	4.3	0.20	
Indeno(1,2,3-cd)pyrene	193-39-5	0.68	0.20	
Dibenz(a,h)anthracene	53-70-3	0.76	0.20	
Benzo(g,h,i)perylene	191-24-2	2.9	0.20	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
SIM

Client Sample ID:	D7-33	LAL Sample ID:	L7305-84
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	26-JUN-96
Matrix:	Water	Analytical Batch ID:	070396-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	5
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	502% *	40-114
2-Fluorobiphenyl	85%	41-111
Terphenyl-d14	61%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	3.5	2.0	
Acenaphthylene	208-96-8	1.8	0.51	
Acenaphthene	83-32-9	5.3	0.51	
Fluorene	86-73-7	5.3	0.51	
Phenanthrene	85-01-8	4.1	0.51	
Anthracene	120-12-7	2.5	0.51	
Fluoranthene	206-44-0	1.3	0.51	
Pyrene	129-00-0	9.0	0.51	
Benzo(a)anthracene	56-55-3	3.4	0.51	
Chrysene	218-01-9	9.0	0.51	
Benzo(b)fluoranthene	205-99-2	2.7	0.51	
Benzo(k)fluoranthene	207-08-9	<0.51	0.51	
Benzo(a)pyrene	50-32-8	4.4	0.51	
Indeno(1,2,3-cd)pyrene	193-39-5	0.84	0.51	
Dibenz(a,h)anthracene	53-70-3	0.96	0.51	
Benzo(g,h,i)perylene	191-24-2	3.2	0.51	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
) SIM

Client Sample ID:	C6-R04	LAL Sample ID:	L7305-86
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	26-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	94%	40-114
2-Fluorobiphenyl	74%	41-111
Terphenyl-d14	72%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	<0.40	0.40	
Acenaphthylene	208-96-8	<0.10	0.10	
Acenaphthene	83-32-9	<0.10	0.10	
Fluorene	86-73-7	<0.10	0.10	
Phenanthrene	85-01-8	<0.10	0.10	
Anthracene	120-12-7	<0.10	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	<0.10	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	<0.10	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
ε SIM

Client Sample ID:	C6-R36	LAL Sample ID:	L7305-90
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	26-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	70%	40-114
2-Fluorobiphenyl	69%	41-111
Terphenyl-d14	117%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	<0.40	0.40	
Acenaphthylene	208-96-8	<0.10	0.10	
Acenaphthene	83-32-9	<0.10	0.10	
Fluorene	86-73-7	<0.10	0.10	
Phenanthrene	85-01-8	<0.10	0.10	
Anthracene	120-12-7	<0.10	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	0.13	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	<0.10	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
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Client Sample ID:	D6-R34	LAL Sample ID:	L7305-92
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	26-JUN-96
Matrix:	Water	Analytical Batch ID:	070396-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	143% *	40-114
2-Fluorobiphenyl	62%	41-111
Terphenyl-d14	63%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	11.	0.40	E
Acenaphthylene	208-96-8	0.36	0.10	
Acenaphthene	83-32-9	2.9	0.10	
Fluorene	86-73-7	1.2	0.10	
Phenanthrene	85-01-8	0.32	0.10	
Anthracene	120-12-7	0.22	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	0.66	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	0.26	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
0 SIM

Client Sample ID:	D6-R34	LAL Sample ID:	L7305-92
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	26-JUN-96
Matrix:	Water	Analytical Batch ID:	070396-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	2
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	131% *	40-114
2-Fluorobiphenyl	67%	41-111
Terphenyl-d14	60%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	10.	0.81	
Acenaphthylene	208-96-8	0.43	0.20	
Acenaphthene	83-32-9	3.5	0.20	
Fluorene	86-73-7	1.5	0.20	
Phenanthrene	85-01-8	0.33	0.20	
Anthracene	120-12-7	0.25	0.20	
Fluoranthene	206-44-0	<0.20	0.20	
Pyrene	129-00-0	0.60	0.20	
Benzo(a)anthracene	56-55-3	<0.20	0.20	
Chrysene	218-01-9	0.31	0.20	
Benzo(b)fluoranthene	205-99-2	<0.20	0.20	
Benzo(k)fluoranthene	207-08-9	<0.20	0.20	
Benzo(a)pyrene	50-32-8	<0.20	0.20	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.20	0.20	
Dibenz(a,h)anthracene	53-70-3	<0.20	0.20	
Benzo(g,h,i)perylene	191-24-2	<0.20	0.20	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
SIM

Client Sample ID:	B8-D1	LAL Sample ID:	L7305-94
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	26-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	55%	40-114
2-Fluorobiphenyl	51%	41-111
Terphenyl-d14	103%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	<0.40	0.40	
Acenaphthylene	208-96-8	<0.10	0.10	
Acenaphthene	83-32-9	<0.10	0.10	
Fluorene	86-73-7	<0.10	0.10	
Phenanthrene	85-01-8	<0.10	0.10	
Anthracene	120-12-7	<0.10	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	0.11	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	<0.10	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
) SIM

Client Sample ID:	D7-34	LAL Sample ID:	L7305-96
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	26-JUN-96
Matrix:	Water	Analytical Batch ID:	070396-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	91%	40-114
2-Fluorobiphenyl	79%	41-111
Terphenyl-d14	66%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	<0.40	0.40	
Acenaphthylene	208-96-8	<0.10	0.10	
Acenaphthene	83-32-9	<0.10	0.10	
Fluorene	86-73-7	<0.10	0.10	
Phenanthrene	85-01-8	<0.10	0.10	
Anthracene	120-12-7	<0.10	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	<0.10	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	<0.10	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
SIM

Client Sample ID:	D7-15	LAL Sample ID:	L7305-98
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	26-JUN-96
Matrix:	Water	Analytical Batch ID:	070396-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	173% *	40-114
2-Fluorobiphenyl	85%	41-111
Terphenyl-d14	38%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	19.	0.40	E
Acenaphthylene	208-96-8	2.8	0.10	
Acenaphthene	83-32-9	6.9	0.10	
Fluorene	86-73-7	8.0	0.10	
Phenanthrene	85-01-8	13.	0.10	E
Anthracene	120-12-7	0.91	0.10	
Fluoranthene	206-44-0	0.20	0.10	
Pyrene	129-00-0	1.9	0.10	
Benzo(a)anthracene	56-55-3	0.71	0.10	
Chrysene	218-01-9	1.6	0.10	
Benzo(b)fluoranthene	205-99-2	0.33	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	0.59	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	0.25	0.10	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
70 SIM

Client Sample ID:	D7-15	LAL Sample ID:	L7305-98
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	08-JUL-96	Date Extracted:	26-JUN-96
Matrix:	Water	Analytical Batch ID:	070896-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	100
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	233% *	40-114
2-Fluorobiphenyl	80%	41-111
Terphenyl-d14	66%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	460	40.	
Acenaphthylene	208-96-8	<10.	10.	
Acenaphthene	83-32-9	<10.	10.	
Fluorene	86-73-7	<10.	10.	
Phenanthrene	85-01-8	15.	10.	
Anthracene	120-12-7	<10.	10.	
Fluoranthene	206-44-0	<10.	10.	
Pyrene	129-00-0	<10.	10.	
Benzo(a)anthracene	56-55-3	<10.	10.	
Chrysene	218-01-9	<10.	10.	
Benzo(b)fluoranthene	205-99-2	<10.	10.	
Benzo(k)fluoranthene	207-08-9	<10.	10.	
Benzo(a)pyrene	50-32-8	<10.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	<10.	10.	
Dibenz(a,h)anthracene	53-70-3	<10.	10.	
Benzo(g,h,i)perylene	191-24-2	<10.	10.	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
SIM

Client Sample ID:	I3-67	LAL Sample ID:	L7305-99
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	26-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	61%	40-114
2-Fluorobiphenyl	57%	41-111
Terphenyl-d14	90%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	<0.40	0.40	
Acenaphthylene	208-96-8	<0.10	0.10	
Acenaphthene	83-32-9	<0.10	0.10	
Fluorene	86-73-7	<0.10	0.10	
Phenanthrene	85-01-8	<0.10	0.10	
Anthracene	120-12-7	<0.10	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	<0.10	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	<0.10	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
) SIM

Client Sample ID:	B4-61	LAL Sample ID:	L7305-101
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	26-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	66%	40-114
2-Fluorobiphenyl	54%	41-111
Terphenyl-d14	118%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	<0.40	0.40	
Acenaphthylene	208-96-8	<0.10	0.10	
Acenaphthene	83-32-9	<0.10	0.10	
Fluorene	86-73-7	<0.10	0.10	
Phenanthrene	85-01-8	<0.10	0.10	
Anthracene	120-12-7	<0.10	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	<0.10	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	<0.10	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS

Client Sample ID:	Method Blank	LAL Sample ID:	38459MB
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	02-JUL-96	Date Extracted:	26-JUN-96
		Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	52%	40-114
2-Fluorobiphenyl	38% *	41-111
Terphenyl-d14	86%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	<0.40	0.40	
Acenaphthylene	208-96-8	<0.10	0.10	
Acenaphthene	83-32-9	<0.10	0.10	
Fluorene	86-73-7	<0.10	0.10	
Phenanthrene	85-01-8	<0.10	0.10	
Anthracene	120-12-7	<0.10	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	<0.10	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	<0.10	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS

Client Sample ID:	Method Blank	LAL Sample ID:	38459MB
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	03-JUL-96	Date Extracted:	26-JUN-96
		Analytical Batch ID:	070396-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	54%	40-114
2-Fluorobiphenyl	38% *	41-111
Terphenyl-d14	89%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	<0.40	0.40	
Acenaphthylene	208-96-8	<0.10	0.10	
Acenaphthene	83-32-9	<0.10	0.10	
Fluorene	86-73-7	<0.10	0.10	
Phenanthrene	85-01-8	<0.10	0.10	
Anthracene	120-12-7	<0.10	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	<0.10	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	<0.10	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
SVOAS BY SIM GC/MS

Client Sample ID:	C6-R04	LAL Sample ID:	38459MS
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	26-JUN-96
		Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	76%	40-114
2-Fluorobiphenyl	66%	41-111
Terphenyl-d14	66%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	2.5	0.40	
Acenaphthylene	208-96-8	3.2	0.10	
Acenaphthene	83-32-9	3.2	0.10	
Fluorene	86-73-7	3.7	0.10	
Phenanthrene	85-01-8	3.7	0.10	
Anthracene	120-12-7	3.5	0.10	
Fluoranthene	206-44-0	3.5	0.10	
Pyrene	129-00-0	3.3	0.10	
Benzo(a)anthracene	56-55-3	2.6	0.10	
Chrysene	218-01-9	2.7	0.10	
Benzo(b)fluoranthene	205-99-2	2.3	0.10	
Benzo(k)fluoranthene	207-08-9	2.1	0.10	
Benzo(a)pyrene	50-32-8	2.1	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	2.1	0.10	
Dibenz(a,h)anthracene	53-70-3	2.2	0.10	
Benzo(g,h,i)perylene	191-24-2	2.1	0.10	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
SVOAS BY SIM GC/MS

Client Sample ID:	C6-R04	LAL Sample ID:	38459MS
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	26-JUN-96
		Analytical Batch ID:	070396-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	81%	40-114
2-Fluorobiphenyl	65%	41-111
Terphenyl-d14	59%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	2.3	0.40	
Acenaphthylene	208-96-8	3.3	0.10	
Acenaphthene	83-32-9	3.3	0.10	
Fluorene	86-73-7	4.0	0.10	
Phenanthrene	85-01-8	3.6	0.10	
Anthracene	120-12-7	3.5	0.10	
Fluoranthene	206-44-0	3.8	0.10	
Pyrene	129-00-0	3.0	0.10	
Benzo(a)anthracene	56-55-3	2.6	0.10	
Chrysene	218-01-9	2.6	0.10	
Benzo(b)fluoranthene	205-99-2	2.2	0.10	
Benzo(k)fluoranthene	207-08-9	2.0	0.10	
Benzo(a)pyrene	50-32-8	2.0	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	2.2	0.10	
Dibenz(a,h)anthracene	53-70-3	2.2	0.10	
Benzo(g,h,i)perylene	191-24-2	2.2	0.10	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
SVOAS BY SIM GC/MS

Client Sample ID:	C6-R04	LAL Sample ID:	38459MSD
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	26-JUN-96
		Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	78%	40-114
2-Fluorobiphenyl	63%	41-111
Terphenyl-d14	76%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	2.4	0.40	
Acenaphthylene	208-96-8	3.0	0.10	
Acenaphthene	83-32-9	3.0	0.10	
Fluorene	86-73-7	3.6	0.10	
Phenanthrene	85-01-8	3.7	0.10	
Anthracene	120-12-7	3.5	0.10	
Fluoranthene	206-44-0	3.6	0.10	
Pyrene	129-00-0	3.8	0.10	
Benzo(a)anthracene	56-55-3	2.9	0.10	
Chrysene	218-01-9	2.9	0.10	
Benzo(b)fluoranthene	205-99-2	2.3	0.10	
Benzo(k)fluoranthene	207-08-9	2.1	0.10	
Benzo(a)pyrene	50-32-8	2.1	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	1.8	0.10	
Dibenz(a,h)anthracene	53-70-3	1.8	0.10	
Benzo(g,h,i)perylene	191-24-2	1.8	0.10	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
SVOAS BY SIM GC/MS

Client Sample ID:	C6-R04	LAL Sample ID:	38459MSD
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	26-JUN-96
		Analytical Batch ID:	070396-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	79%	40-114
2-Fluorobiphenyl	60%	41-111
Terphenyl-d14	64%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	2.4	0.40	
Acenaphthylene	208-96-8	2.9	0.10	
Acenaphthene	83-32-9	2.9	0.10	
Fluorene	86-73-7	3.7	0.10	
Phenanthrene	85-01-8	3.6	0.10	
Anthracene	120-12-7	3.4	0.10	
Fluoranthene	206-44-0	3.8	0.10	
Pyrene	129-00-0	3.1	0.10	
Benzo(a)anthracene	56-55-3	2.8	0.10	
Chrysene	218-01-9	2.9	0.10	
Benzo(b)fluoranthene	205-99-2	2.2	0.10	
Benzo(k)fluoranthene	207-08-9	2.0	0.10	
Benzo(a)pyrene	50-32-8	2.1	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	1.9	0.10	
Dibenz(a,h)anthracene	53-70-3	1.9	0.10	
Benzo(g,h,i)perylene	191-24-2	1.8	0.10	

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LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
SVOAS BY SIM GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38459LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	02-JUL-96	Date Extracted:	26-JUN-96
		Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	65%	40-114
2-Fluorobiphenyl	52%	41-111
Terphenyl-d14	104%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	2.1	0.40	
Acenaphthylene	208-96-8	2.5	0.10	
Acenaphthene	83-32-9	2.6	0.10	
Fluorene	86-73-7	3.2	0.10	
Phenanthrene	85-01-8	3.8	0.10	
Anthracene	120-12-7	3.6	0.10	
Fluoranthene	206-44-0	4.3	0.10	
Pyrene	129-00-0	3.8	0.10	
Benzo(a)anthracene	56-55-3	3.9	0.10	
Chrysene	218-01-9	4.0	0.10	
Benzo(b)fluoranthene	205-99-2	4.1	0.10	
Benzo(k)fluoranthene	207-08-9	3.7	0.10	
Benzo(a)pyrene	50-32-8	3.5	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	2.9	0.10	
Dibenz(a,h)anthracene	53-70-3	2.6	0.10	
Benzo(g,h,i)perylene	191-24-2	3.0	0.10	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
SVOAS BY SIM GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38459LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	03-JUL-96	Date Extracted:	26-JUN-96
		Analytical Batch ID:	070396-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	69%	40-114
2-Fluorobiphenyl	50%	41-111
Terphenyl-d14	84%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	2.1	0.40	
Acenaphthylene	208-96-8	2.5	0.10	
Acenaphthene	83-32-9	2.6	0.10	
Fluorene	86-73-7	3.6	0.10	
Phenanthrene	85-01-8	3.8	0.10	
Anthracene	120-12-7	3.8	0.10	
Fluoranthene	206-44-0	4.8	0.10	
Pyrene	129-00-0	3.0	0.10	
Benzo(a)anthracene	56-55-3	3.5	0.10	
Chrysene	218-01-9	3.5	0.10	
Benzo(b)fluoranthene	205-99-2	3.6	0.10	
Benzo(k)fluoranthene	207-08-9	3.2	0.10	
Benzo(a)pyrene	50-32-8	3.2	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	2.9	0.10	
Dibenz(a,h)anthracene	53-70-3	2.7	0.10	
Benzo(g,h,i)perylene	191-24-2	2.9	0.10	

LOCKHEED ANALYTICAL SERVICES

MATRIX SPIKE DATA SUMMARY
SVOAS BY SIM GC/MS

Client Sample ID:	C6-R04	LAL Sample ID:	38459MS
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	26-JUN-96
		Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	76%	40-114
2-Fluorobiphenyl	66%	41-111
Terphenyl-d14	66%	33-141

Constituent	Spike Added ug/L	Sample Concentration ug/L	MS Concentration ug/L	% Recovery	QC Limits % Recovery
Naphthalene	4.04	0.000	2.48	61	60-130
Acenaphthylene	4.04	0.000	3.20	79	60-130
Acenaphthene	4.04	0.000	3.24	80	60-130
Fluorene	4.04	0.000	3.73	92	60-130
Phenanthrene	4.04	0.000	3.71	92	60-130
Anthracene	4.04	0.000	3.48	86	60-130
Fluoranthene	4.04	0.000	3.46	86	60-130
Pyrene	4.04	0.0325	3.34	82	60-130
Benzo(a)anthracene	4.04	0.0139	2.59	64	60-130
Chrysene	4.04	0.0141	2.65	65	60-130
Benzo(b)fluoranthene	4.04	0.000	2.28	56*	60-130
Benzo(k)fluoranthene	4.04	0.000	2.10	52*	60-130
Benzo(a)pyrene	4.04	0.000	2.10	52*	60-130
Indeno(1,2,3-cd)pyrene	4.04	0.000	2.09	52*	60-130
Dibenz(a,h)anthracene	4.04	0.0103	2.15	53*	60-130
Benzo(g,h,i)perylene	4.04	0.000	2.06	51*	60-130

LOCKHEED ANALYTICAL SERVICES

MATRIX SPIKE DUPLICATE DATA SUMMARY
SVOAS BY SIM GC/MS

Client Sample ID:	C6-R04	LAL Sample ID:	38459MSD
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	26-JUN-96
		Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	78%	40-114
2-Fluorobiphenyl	63%	41-111
Terphenyl-d14	76%	33-141

Constituent	Spike Added ug/L	MSD Concentration ug/L	% Recovery	RPD	QC Limits RPD	QC Limits % Recovery
Naphthalene	4.04	2.39	59*	4	50	60-130
Acenaphthylene	4.04	2.96	73	8	50	60-130
Acenaphthene	4.04	2.97	74	9	50	60-130
Fluorene	4.04	3.57	88	4	50	60-130
Phenanthrene	4.04	3.72	92	0	50	60-130
Anthracene	4.04	3.48	86	0	50	60-130
Fluoranthene	4.04	3.60	89	4	50	60-130
Pyrene	4.04	3.79	93	13	50	60-130
Benzo(a)anthracene	4.04	2.88	71	11	50	60-130
Chrysene	4.04	2.90	71	9	50	60-130
Benzo(b)fluoranthene	4.04	2.33	58*	2	50	60-130
Benzo(k)fluoranthene	4.04	2.14	53*	2	50	60-130
Benzo(a)pyrene	4.04	2.11	52*	0	50	60-130
Indeno(1,2,3-cd)pyrene	4.04	1.78	44*	16	50	60-130
Dibenz(a,h)anthracene	4.04	1.78	44*	19	50	60-130
Benzo(g,h,i)perylene	4.04	1.76	44*	16	50	60-130

LOCKHEED ANALYTICAL SERVICES

MATRIX SPIKE DATA SUMMARY
SVOAS BY SIM GC/MS

Client Sample ID:	C6-R04	LAL Sample ID:	38459MS
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	26-JUN-96
		Analytical Batch ID:	070396-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	81%	40-114
2-Fluorobiphenyl	65%	41-111
Terphenyl-d14	59%	33-141

Constituent	Spike Added ug/L	Sample Concentration ug/L	MS Concentration ug/L	% Recovery	QC Limits % Recovery
Naphthalene	4.04	0.000	2.34	58*	60-130
Acenaphthylene	4.04	0.000	3.30	82	60-130
Acenaphthene	4.04	0.000	3.25	80	60-130
Fluorene	4.04	0.000	3.96	98	60-130
Phenanthrene	4.04	0.000	3.62	90	60-130
Anthracene	4.04	0.000	3.45	85	60-130
Fluoranthene	4.04	0.000	3.76	93	60-130
rene	4.04	0.0325	3.02	74	60-130
nzo(a)anthracene	4.04	0.0139	2.56	63	60-130
Chrysene	4.04	0.0141	2.60	64	60-130
Benzo(b)fluoranthene	4.04	0.000	2.17	54*	60-130
Benzo(k)fluoranthene	4.04	0.000	2.03	50*	60-130
Benzo(a)pyrene	4.04	0.000	2.04	50*	60-130
Indeno(1,2,3-cd)pyrene	4.04	0.000	2.15	53*	60-130
Dibenz(a,h)anthracene	4.04	0.0103	2.22	55*	60-130
Benzo(g,h,i)perylene	4.04	0.000	2.17	54*	60-130

LOCKHEED ANALYTICAL SERVICES

MATRIX SPIKE DUPLICATE DATA SUMMARY
SVOAS BY SIM GC/MS

Client Sample ID:	C6-R04	LAL Sample ID:	38459MSD
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	26-JUN-96
		Analytical Batch ID:	070396-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	79%	40-114
2-Fluorobiphenyl	60%	41-111
Terphenyl-d14	64%	33-141

Constituent	Spike Added ug/L	MSD Concentration ug/L	% Recovery	RPD	QC Limits RPD	QC Limits % Recovery
Naphthalene	4.04	2.35	58*	0	50	60-130
Acenaphthylene	4.04	2.93	73	12	50	60-130
Acenaphthene	4.04	2.92	72	11	50	60-130
Fluorene	4.04	3.70	92	7	50	60-130
Phenanthrene	4.04	3.60	89	1	50	60-130
Anthracene	4.04	3.44	85	0	50	60-130
Fluoranthene	4.04	3.82	95	2	50	60-130
Pyrene	4.04	3.13	77	4	50	60-130
Benzo(a)anthracene	4.04	2.84	70	10	50	60-130
Chrysene	4.04	2.85	70	9	50	60-130
Benzo(b)fluoranthene	4.04	2.23	55*	3	50	60-130
Benzo(k)fluoranthene	4.04	2.00	50*	1	50	60-130
Benzo(a)pyrene	4.04	2.06	51*	1	50	60-130
Indeno(1,2,3-cd)pyrene	4.04	1.86	46*	14	50	60-130
Dibenz(a,h)anthracene	4.04	1.86	46*	18	50	60-130
Benzo(g,h,i)perylene	4.04	1.83	45*	17	50	60-130

LOCKHEED ANALYTICAL SERVICES

LCS DATA SUMMARY
SVOAS BY SIM GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38459LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	02-JUL-96	Date Extracted:	26-JUN-96
		Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	65%	40-114
2-Fluorobiphenyl	52%	41-111
Terphenyl-d14	104%	33-141

Constituent	Spike Added ug/L	LCS Concentration ug/L	LCS % Recovery	QC Limits
Naphthalene	4.00	2.11	53*	60-130
Acenaphthylene	4.00	2.45	61	60-130
Acenaphthene	4.00	2.57	64	60-130
Fluorene	4.00	3.23	81	60-130
Phenanthrene	4.00	3.81	95	60-130
Anthracene	4.00	3.62	91	60-130
Fluoranthene	4.00	4.28	107	60-130
Pyrene	4.00	3.79	95	60-130
Benzo(a)anthracene	4.00	3.92	98	60-130
Chrysene	4.00	4.03	101	60-130
Benzo(b)fluoranthene	4.00	4.10	103	60-130
Benzo(k)fluoranthene	4.00	3.67	92	60-130
Benzo(a)pyrene	4.00	3.48	87	60-130
Indeno(1,2,3-cd)pyrene	4.00	2.85	71	60-130
Dibenz(a,h)anthracene	4.00	2.64	66	60-130
Benzo(g,h,i)perylene	4.00	2.98	75	60-130

LOCKHEED ANALYTICAL SERVICES

LCS DATA SUMMARY
PAHS BY SIM GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38459LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	03-JUL-96	Date Extracted:	26-JUN-96
		Analytical Batch ID:	070396-8270-L
QC Group:	8270 SIM_38459	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	69%	40-114
2-Fluorobiphenyl	50%	41-111
Terphenyl-d14	84%	33-141

Constituent	Spike Added ug/L	LCS Concentration ug/L	LCS % Recovery	QC Limits
Naphthalene	4.00	2.14	54*	60-130
Acenaphthylene	4.00	2.51	63	60-130
Acenaphthene	4.00	2.58	65	60-130
Fluorene	4.00	3.58	90	60-130
Phenanthrene	4.00	3.76	94	60-130
Anthracene	4.00	3.77	94	60-130
Fluoranthene	4.00	4.78	120	60-130
Pyrene	4.00	2.97	74	60-130
Benzo(a)anthracene	4.00	3.48	87	60-130
Chrysene	4.00	3.45	86	60-130
Benzo(b)fluoranthene	4.00	3.57	89	60-130
Benzo(k)fluoranthene	4.00	3.20	80	60-130
Benzo(a)pyrene	4.00	3.16	79	60-130
Indeno(1,2,3-cd)pyrene	4.00	2.87	72	60-130
Dibenz(a,h)anthracene	4.00	2.69	67	60-130
Benzo(g,h,i)perylene	4.00	2.94	74	60-130

OCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

trument ID: hpl

Date/Time Analyzed: 02-JUL-96 08:55

LAL Batch ID: 070296-8270-L

		IS1 Area	RT	IS2 Area	RT	IS3 Area	RT
12 HOUR STD		598283	6.332	2100365	7.772	984387	10.433
UPPER LIMIT		1196566	6.832	4200730	8.272	1968774	10.933
LOWER LIMIT		299142	5.832	1050183	7.272	492194	9.933
Client Sample ID	LAL Sample ID						
thod Blank	38459MB	409268	6.337	1462740	7.772	736637	10.433
b Ctrl Sample	38459LCS	690482	6.337	2290730	7.772	1123666	10.433
-76	L7312-29	785025	6.337	2291864	7.772	1147002	10.433
-R36	L7305-90	707481	6.337	2028347	7.772	961953	10.433
-R04	38459MS	751971	6.337	2184569	7.772	1040534	10.433
-R04	38459MSD	791560	6.337	2318068	7.772	1117442	10.433
b Ctrl Sample Dup	38524LCSDUP	816248	6.337	2663065	7.772	1311601	10.441
-58	L7305-68	739546	6.337	2327573	7.772	1081328	10.441
-62	L7305-70	741805	6.341	2242033	7.780	1031619	10.441
-R37	L7305-72	728517	6.341	2218668	7.780	1130779	10.441
-64	L7305-74	892218	6.341	2621237	7.780	1251596	10.441
-54	L7305-76	834383	6.341	2478268	7.780	1132567	10.441
-48	L7305-80	680905	6.341	2033609	7.780	923449	10.441
-R04	L7305-86	751213	6.341	2199860	7.780	1039830	10.441

UPPER LIMIT = +100% of internal standard area
LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS1 = 1,4-DICHLOROBENZENE-D4
IS2 = NAPHTHALENE-D8
IS3 = ACENAPHTHENE-D10

OCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

trument ID: hpl

Date/Time Analyzed: 02-JUL-96 08:55
LAL Batch ID: 070296-8270-L

		IS4 Area	RT	IS5 Area	RT	IS6 Area	RT
12 HOUR STD		1066456	13.146	623739	18.402	696477	21.103
UPPER LIMIT		2132912	13.646	1247478	18.902	1392954	21.603
LOWER LIMIT		533228	12.646	311870	17.902	348239	20.603
Client Sample ID	LAL Sample ID						
thod Blank	38459MB	950242	13.145	632189	18.401	714589	21.103
b Ctrl Sample	38459LCS	1392039	13.154	936494	18.402	990129	21.103
-76	L7312-29	1328764	13.154	777700	18.402	800715	21.103
-R36	L7305-90	1190936	13.154	746463	18.401	791978	21.103
-R04	38459MS	1250730	13.154	756160	18.402	776607	21.103
-R04	38459MSD	1359543	13.154	761098	18.402	775567	21.103
b Ctrl Sample Dup	38524LCSDUP	1586393	13.154	861366	18.402	900096	21.103
-58	L7305-68	1333146	13.154	755871	18.402	808414	21.110
-62	L7305-70	1295778	13.154	733285	18.409	746477	21.110
-R37	L7305-72	1542738	13.154	809085	18.409	820056	21.110
-64	L7305-74	1540363	13.154	831625	18.409	870453	21.110
-54	L7305-76	1363376	13.154	699831	18.409	722357	21.110
-48	L7305-80	1188894	13.154	772119	18.409	855033	21.110
-R04	L7305-86	1269727	13.154	708108	18.409	729116	21.110

A UPPER LIMIT = +100% of internal standard area
A LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS4 = PHENANTHRENE-D10
IS5 = CHRYSENE-D12
IS6 = PERYLENE-D12

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

trument ID: hpl

Date/Time Analyzed: 02-JUL-96 08:55
LAL Batch ID: 070296-8270-L

		IS1 Area	RT	IS2 Area	RT	IS3 Area	RT
12 HOUR STD		598283	6.332	2100365	7.772	984387	10.433
UPPER LIMIT		1196566	6.832	4200730	8.272	1968774	10.933
LOWER LIMIT		299142	5.832	1050183	7.272	492194	9.933
Client Sample ID	LAL Sample ID						
-56	L7305-66	674196	6.341	2062026	7.780	984917	10.441
-61	L7305-101	768256	6.341	2375199	7.780	1135939	10.441
-67	L7305-99	758270	6.341	2454001	7.780	1295564	10.441
-D1	L7305-94	620168	6.341	1862771	7.780	964909	10.441

A UPPER LIMIT = +100% of internal standard area
A LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS1 = 1,4-DICHLOROBENZENE-D4
IS2 = NAPHTHALENE-D8
IS3 = ACENAPHTHENE-D10

)CKHEED ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

:rument ID: hpl

Date/Time Analyzed: 02-JUL-96 08:55

LAL Batch ID: 070296-8270-L

		IS4 Area	RT	IS5 Area	RT	IS6 Area	RT
12 HOUR STD		1066456	13.146	623739	18.402	696477	21.103
UPPER LIMIT		2132912	13.646	1247478	18.902	1392954	21.603
LOWER LIMIT		533228	12.646	311870	17.902	348239	20.603
Client Sample ID	LAL Sample ID						
-56	L7305-66	1235964	13.154	684612	18.409	682551	21.110
-61	L7305-101	1287972	13.154	612028	18.409	642260	21.110
-67	L7305-99	1633890	13.154	837292	18.409	882999	21.110
-D1	L7305-94	1244394	13.154	793897	18.409	826958	21.110

A UPPER LIMIT = +100% of internal standard area
A LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS4 = PHENANTHRENE-D10
IS5 = CHRYSENE-D12
IS6 = PERYLENE-D12

...OCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

trument ID: hpl

Date/Time Analyzed: 03-JUL-96 08:42
LAL Batch ID: 070396-8270-L

		IS1 Area	RT	IS2 Area	RT	IS3 Area	RT
12 HOUR STD		585769	6.332	1960661	7.764	972041	10.433
UPPER LIMIT		1171538	6.832	3921322	8.264	1944082	10.933
LOWER LIMIT		292885	5.832	980331	7.264	486021	9.933
Client Sample ID	LAL Sample ID						
ethod Blank	38459MB	489247	6.332	1578186	7.772	764577	10.433
7-51	L7305-82	684278	6.337	1796756	7.780	988552	10.433
7-34	L7305-96	609604	6.337	1806298	7.772	833185	10.433
3-50	L7305-78	468054	6.337	1179828	7.780	605900	10.433
7-15	L7305-98	360889	6.341	1231906	7.756	578944	10.455
6-R34	L7305-92	469434	6.337	1184845	7.780	773031	10.450
7-33	L7305-84	307546	6.341	793452*	7.789	541514	10.459
ab Ctrl Sample	38459LCS	406903	6.337	1376420	7.780	796277	10.441
6-R04	38459MS	468155	6.341	1555036	7.780	821419	10.441
6-R04	38459MSD	481250	6.341	1515882	7.780	850810	10.441
6-R34	L7305-92	323834	6.341	970722*	7.780	574714	10.450
7-33	L7305-84	355788	6.341	1007001	7.788	605935	10.450

EA UPPER LIMIT = +100% of internal standard area
EA LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS1 = 1,4-DICHLOROBENZENE-D4
IS2 = NAPHTHALENE-D8
IS3 = ACENAPHTHENE-D10

000127

OCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

strument ID: hpl

Date/Time Analyzed: 03-JUL-96 08:42
LAL Batch ID: 070396-8270-L

		IS4 Area	RT	IS5 Area	RT	IS6 Area	RT
12 HOUR STD		1172736	13.145	599138	18.402	622496	21.096
UPPER LIMIT		2345472	13.645	1198276	18.902	1244992	21.596
LOWER LIMIT		586368	12.645	299569	17.902	311248	20.596
Client Sample ID	LAL Sample ID						
ethod Blank	38459MB	973272	13.146	574910	18.402	626944	21.103
-51	L7305-82	1317025	13.154	568979	18.402	589608	21.103
-34	L7305-96	1029097	13.146	638754	18.402	715467	21.103
-50	L7305-78	792999	13.154	585449	18.409	693638	21.110
-15	L7305-98	1014404	13.168	784518	18.485	937855	21.144
-R34	L7305-92	946515	13.163	510591	18.416	556746	21.117
-33	L7305-84	781623	13.172	566825	18.493	721381	21.166
b Ctrl Sample	38459LCS	1210313	13.163	1168505	18.415	1261589*	21.116
-R04	38459MS	1165284	13.163	862929	18.416	984248	21.124
-R04	38459MSD	1188797	13.163	861374	18.416	982685	21.117
-R34	L7305-92	883392	13.163	641015	18.423	739762	21.131
-33	L7305-84	956109	13.172	637793	18.458	767306	21.145

A UPPER LIMIT = +100% of internal standard area
A LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS4 = PHENANTHRENE-D10
IS5 = CHRYSENE-D12
IS6 = PERYLENE-D12

OCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

strument ID: hpl

Date/Time Analyzed: 08-JUL-96 08:48

LAL Batch ID: 070896-8270-L

Client Sample ID	LAL Sample ID	IS1 Area	RT	IS2 Area	RT	IS3 Area	RT
12 HOUR STD		358863	6.332	1173549	7.772	604508	10.433
UPPER LIMIT		717726	6.832	2347098	8.272	1209016	10.933
LOWER LIMIT		179432	5.832	586775	7.272	302254	9.933
7-15	L7305-98	297663	6.337	902009	7.780	482315	10.450

EA UPPER LIMIT = +100% of internal standard area
EA LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS1 = 1,4-DICHLOROBENZENE-D4
IS2 = NAPHTHALENE-D8
IS3 = ACENAPHTHENE-D10

OCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

strument ID: hpl

Date/Time Analyzed: 03-JUL-96 08:42
LAL Batch ID: 070396-8270-L

		IS4 Area	RT	IS5 Area	RT	IS6 Area	RT
12 HOUR STD		1172736	13.145	599138	18.402	622496	21.096
UPPER LIMIT		2345472	13.645	1198276	18.902	1244992	21.596
LOWER LIMIT		586368	12.645	299569	17.902	311248	20.596
Client Sample ID	LAL Sample ID						
ethod Blank	38459MB	973272	13.146	574910	18.402	626944	21.103
7-51	L7305-82	1317025	13.154	568979	18.402	589608	21.103
7-34	L7305-96	1029097	13.146	638754	18.402	715467	21.103
3-50	L7305-78	792999	13.154	585449	18.409	693638	21.110
7-15	L7305-98	1014404	13.168	784518	18.485	937855	21.144
5-R34	L7305-92	946515	13.163	510591	18.416	556746	21.117
7-33	L7305-84	781623	13.172	566825	18.493	721381	21.166
ab Ctrl Sample	38459LCS	1210313	13.163	1168505	18.415	1261589*	21.116
5-R04	38459MS	1165284	13.163	862929	18.416	984248	21.124
5-R04	38459MSD	1188797	13.163	861374	18.416	982685	21.117
5-R34	L7305-92	883392	13.163	641015	18.423	739762	21.131
7-33	L7305-84	956109	13.172	637793	18.458	767306	21.145

EA UPPER LIMIT = +100% of internal standard area
EA LOWER LIMIT = -50% of internal standard area
PPER LIMIT = +0.50 minutes of internal standard RT
OWER LIMIT = -0.50 minutes of internal standard RT

IS4 = PHENANTHRENE-D10
IS5 = CHRYSENE-D12
IS6 = PERYLENE-D12

OR00128

OCKHL_D ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

ıtrument ID: hpl

Date/Time Analyzed: 08-JUL-96 08:48
LAL Batch ID: 070896-8270-L

Client Sample ID	LAL Sample ID	IS1 Area	RT	IS2 Area	RT	IS3 Area	RT
12 HOUR STD		358863	6.332	1173549	7.772	604508	10.433
UPPER LIMIT		717726	6.832	2347098	8.272	1209016	10.933
LOWER LIMIT		179432	5.832	586775	7.272	302254	9.933
7-15	L7305-98	297663	6.337	902009	7.780	482315	10.450

EA UPPER LIMIT = +100% of internal standard area
EA LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS1 = 1,4-DICHLOROBENZENE-D4
IS2 = NAPHTHALENE-D8
IS3 = ACENAPHTHENE-D10

000129

RUN LOGS/EXTRACTION SHEETS

LOCKHEED ANALYTICAL LAB REVIEWED BY _____ INSTRUMENT ID # 6/11/96 PAGE # 000057

ANALYST	DATE	ANAL. NO.	LAL #	DESCRIPTION/CLIENT	SOL #	MATRIX/DIL	DATA FILE	BATCH ID	METHOD FILE	TAPE #	DR	COMMENTS
dp	6/21	0821		50 ng DFTPP	0339-32-7	—	S0101001	1jun2196	L8270SCF1.m	679	DNR	
dp	6/25	1038		50 ng DFTPP	0339-32-7	—	S0101001	1jun2596	L390dfTPP		OK	
		1049		Mix B 50/100 ng/mL Pest Std	0339-39-5	—	S0201002				DNR	
		1121		Mix A 50/100 ng/mL Pest STD		—	S0301003				DNR	Pesticide Confirmation
		1154	L6801-7DL	—		Soil 1:5000	S0401004				DNR	too dilute
		1228	L6774-1DL	—		1:5000	S0501005				DNR	
dp		1301	L6742-5TDL	—		1:5000	S0601006				DNR	
		1335	L6801-7DL	—		1:10	S0701007				Rep	Data given to J. Landers
		1426	L6774-1DL	—		1:10	S0801008				Rep	6/26/96 dp
dp		1455	L6742-5TDL	—		1:10	S0901009			Not Taped	Rep	
dp	7/1/96	1038		SSTD 10.0			S01v1v01	1jul0196	L8270tcfp		RT	RT broken Check
		1155		SSTD 0.5			S02v1v02		L8270scm		DAR	
		1401		8270 DFTPP 50	0339-32-7		S0301003		L8270dfff			RSS 8270
		1419		PAH SSTD 1.0	0339-39-5 0339-39-1		104 v1v04		L8270scm			
		1435		PAH SSTD 5.0	0339-35-5		105 v1v05					
		1520		PAH SSTD 2.0	0339-35-4		106 v1v06					8270 PAH SIM Calib
		1555		PAH SSTD 0.5	0339-35-2		107 v1v07					
		1631		PAH SSTD 0.05	0339-36-2		S08 v1v08				DNR	
		1731		PAH SSTD 10.0	0339-35-6		S09v1v09					
		1751		PAH SSTD 0.05	0339-36-2		S10v1v10				DNR	
		1132	33524-01B			H2O	S11v1v11					
		1907	33524-01				S12v1v12					
		1942	33524-01MS				S13v1v13					
		2017	L7811-25				S14v1v14					
		2052	L7811-29				S15v1v15					weak 1:2 dil
		2128	L7811-30				S16v1v16					
		2202	L7812-31				S17v1v17					
		2238	L7812-32				S18v1v18					
	7/2/96	0845		8270 DFTPP 50	0339-32-7		S01v2v01	1jul0296	L8270dfff			Acc
		0855		PAH SSTD 1.0	0339-35-7 0339-39-1		S02v2v02		L8270scm			Acc
		0931	33524-01D			H2O	S03v2v03					

INSTRUMENT L & K

LOCKHEED ANALYTICAL LAB   REVIEWED BY ____   INSTRUMENT ID # QCMSL   PAGE # 000058

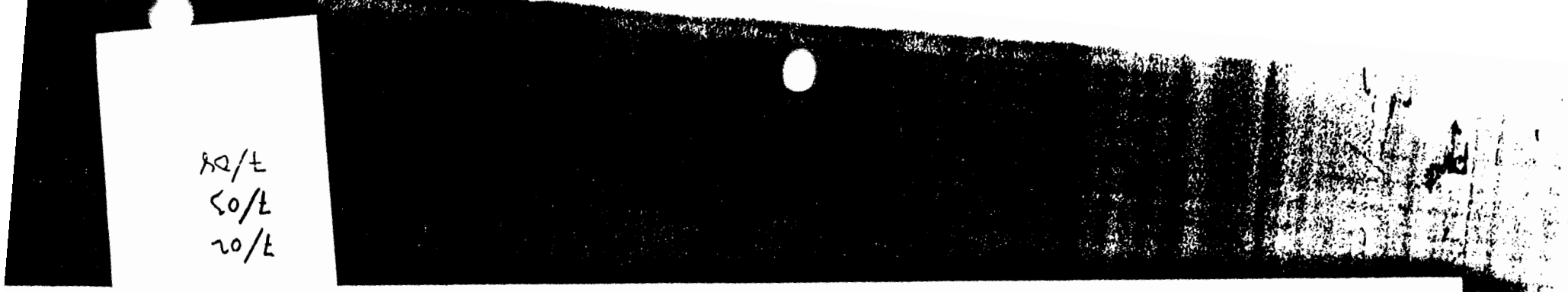
7/02
7/03
7/08

ANALYST	DATE	TIME OF INJ.	LAL #	DESCRIPTION/CLIENT	SOL #	MATRIX/DIL	DATA FILE	BATCH ID	METHOD FILE	TAPE #	DR	COMMENTS
[illegible]	7/2/96	1000	~~2840~~ 38459MB RE		0339-36-1	H2O	S040100 4	1Jul0296	L8270sim		DNR	
		1034	38459LCS				S05 010 05					
		1110	L7312-29			1:2	S06 010 06					
		1145	L7315-90				S07 010 07					
		1220	38459MS				S08 010 08					
		1255	38459MSD				S09 010 09					
		1330	38524LCSDUP				S10 010 10					
		1405	L7305-68				S11 010 11					
		1441	L7305-70				S12 010 12					
		1516	L7305-72				S13 010 13					
		1551	L7305-74				S14 010 14					
		1626	L7305-76				S15 010 15					
		1702	L7305-80				S16 010 16					
		1737	L7305-86				S17 010 17					
		1813	L7305-66				S18 010 18					
		1848	L7305-101				S19 010 19					
		1923	L7305-99				S20 010 20					
		1958	L7305-94				S21 010 21					
				Hexane			S22 010 22				DNR	
				MeCl2			S23 010 23				DNR	
[illegible]	7/03	0833		8270 DFTPP 50	0339-31-7		S01 010 01	1Jul0396	L8270dft			Pass
		0842		PAH SSTD 1.0	0339-35-3 0339-36-1		S02 010 02		L8270sim			Pass
		0926	38459MB	RE		H2O	S03 010 03					
		0952	L7305-82				S04 010 04					
		1027	L7305-96				S05 010 05					
		1102	L7305-78				S06 010 06					
		1137	L7305-98				S07 010 07					
		1212	L7305-92				S08 010 08					
		1247	L7305-84			1:2	S09 010 09					
		1323		MeCl2			S10 010 10					
		1358	38459LCS	RE			S11 010 11					

000132

INSTRUMENT L & K

INSTRUMENT L & K



CKHEED ANALYTICAL LAB REVIEWED BY _____ INSTRUMENT ID # GCHPZL PAGE # 000059

A-ST	DATE	TIME OF INJ.	LAL #	DESCRIPTION/CLIENT	SOL #	MATRIX/DIL	DATA FILE	BATCH ID	METHOD FILE	TAPE #	DR	COMMENTS
	7/03	1433	38459MS	25	0332-36-1	H2O	112 010 12	1jul0396	L8270sim			
		1508	38459MSD	26	↓	↓	113 010 13					
		1544		Hexane	—	—	114 010 14				DNR	
		1619	17305-98		0331-71	H2O 1:2	115 010 15				DNR	
		1654	17305-90			1:2	116 010 16					
		1729	17305-91		↓	1:5	117 010 17					
		1804		CH2Cl2	—	—	118 010 18				DNR	
	7/04/96	0833		8270 DFTPP 50	0329-36-7		501 010 01	1jul0796	L8270alf1			Pass
		0848		Mid SSTD 1.0	0331-83-3 0332-36-1		502 010 02		L8270sim			Pass
		0925	17305-88			H2O 1:10	503 010 03				DNR	
		1037	17305-98			1:100	504 010 04				DNR	
		1104		CH2Cl2 Blank	—	—	505 010 05				DNR	
		1349	17305-78	[illegible]	0331-1	H2O	506 010 06				DNR	STD validation checks
		1517	17305-92	[illegible]	↓	↓	507 010 07				DNR	
	7/05/96	0942		8270 DFTPP 50	0332-32-7		501 010 01	1jul1596	L8270alf1			Pass 8270
		1209		8270 SSTD050	0329-34-2 0332-84-4		502 010 02		L8270lin		DNR	Both lines
		1041		8270 SSTD025	0329-34-3		503 010 03					
		1126		8270 SSTD160	0332-31-7		504 010 04					
		1152		8270 SSTD120	0329-33-7 dil 1:10		505 010 05					
		1227		8270 SSTD080	0329-30-5		506 010 06					
		1302		8270 SSTD040	0329-33-3		507 010 07					
		1337		8270 SSTD010	0329-33-2		508 010 08					
		1508	16251-550	Blank		H2O	509 010 09					
		1536	16251-541	MDL1			510 010 10					
		1611	16251-542	MDL2			511 010 11					
		1645	16251-543	MDL3			512 010 12					
		1720	16251-544	MDL4			513 010 13					
		1755	16251-545	MDL5			514 010 14					
		1930	16251-546	MDL6			515 010 15					
		1905	16251-547	MDL7			516 010 16					
		1940	16251-548	MDL8	↓	↓	517 010 17	↓	↓			

INSTRUMENT L & K

Feedback copy

LOCKHEED ANA :AL SERVICES

TRACKING SHEET DATA REPORT (bs16 PAH)

EXTRACTION SHEET FOR: 8270 SIM Extraction

WORKSHEET NUMBER: 8270 SIM_38459

Continuous

HT = 06/27
DUE 07/04

AL #	QC TYPE	CLIENT ID	DATE COLLECTED	DATE RECEIVED/ CREATED	VOL WT WATER (LH 6/26/96)	WATER SAMPLE pH	SURR ML	MS ML	BROUGHT TO FINAL VOLUME OF (6/28/96)	AMT GIVEN TO ANALYST
7305-68		C6-58	20-JUN-96	24-JUN-96	990ml	7	1.0		1.0ml	1ml
7305-70		A3-62	20-JUN-96	24-JUN-96		7				
7305-72		C6-R37	20-JUN-96	24-JUN-96		7				
7305-74		C2-64	20-JUN-96	24-JUN-96		7				
7305-76		C7-54	20-JUN-96	24-JUN-96		7				
7305-78		D8-50	20-JUN-96	24-JUN-96		7				
7305-80		D8-48	20-JUN-96	24-JUN-96		7				
7305-82		D7-51	20-JUN-96	24-JUN-96		7				
7305-84		D7-33	20-JUN-96	24-JUN-96		7				
7305-86		C6-R04	21-JUN-96	24-JUN-96		7				
7305-90		C6-R36	21-JUN-96	24-JUN-96		7				
7305-92		D6-R34	21-JUN-96	24-JUN-96		7				
7305-94		B8-D1	21-JUN-96	24-JUN-96		7				

ATE STARTED: 6/26/96 DATE COMPLETED: 06-28-96

ONTINUOUS DATE & TIME STARTED: 6/26/96 @ 10:45pm LH DATE & TIME COMPLETED: 6/27/96 @ 5:15pm LH

SIGNED: L. Harris

SIGNED:

SPIKE WITNESS: David T. Hy

C BATCH# : 8270 SIM_38459 LOT #'S

URR ID # : 0859-35-1 CONC: 4.0 ug/ml MECL2: 36073 NA2SO4 : IK05649

S ID # : 0859-35-2 CONC: 4.0 ug/ml ACN : N/A ACETONE: N/A

REVIEWED BY: Dwight Lbaumann

ARRATIVE

EXTRACT COC: RECIEVED BY: DATE: 7-01-96

GCC134

LOCKHEED ANAL AL SERVICES

TRACKING SHEET DATA REPORT (bs16 PAH)

EXTRACTION SHEET FOR: 8270 SIM Extraction

WORKSHEET NUMBER: 8270 SIM_38459

L #	QC TYPE	CLIENT ID	DATE COLLECTED	DATE RECEIVED/ CREATED	VOL/WT EXTR	WATER SAMPLE pH	SURR ML	MS ML	BROUGHT TO FINAL VOLUME OF	AMT GIVEN TO ANALYST
305-96		D7-34	21-JUN-96	24-JUN-96	990ml	7	1.0		1.0ml	1ml
305-98		D7-15	21-JUN-96	24-JUN-96		7				
305-99		I3-67	21-JUN-96	24-JUN-96		7				
305-101		B4-61	21-JUN-96	24-JUN-96		7				
305-66		C6-56	20-JUN-96	24-JUN-96	~~1000ml~~ 1L	7				
459MB	MB	Method Blank		26-JUN-96	1000 ml	7				
459LCS	LCS	Lab Ctrl Sample		26-JUN-96	1000 ml	7				
459MS L7305-88	MS	~~MS/MSD~~ Cp-R04 PL 7/16/96	21-JUN-96	24-JUN-96		7		1.0		
459MSD L7305-89	MSD	~~MS/MSD~~ C6-R04	21-JUN-96	24-JUN-96		7				
~~IKELOT38459~~	~~SPIKELOT~~	~~Spike Lot Sample~~		~~26-JUN-96~~						

06/26/96

E STARTED: _____ DATE COMPLETED: _____ SIGNED: _____

TINUOUS DATE & TIME STARTED: _____ DATE & TIME COMPLETED: _____ SIGNED: _____

BATCH# : 8270 SIM_38459 LOT #'S SPIKE WITNESS: _____

R ID # : _____ CONC: _____ MECL2: _____ NA2SO4 : _____

ID # : _____ CONC: _____ ACN : _____ ACETONE: _____

REVIEWED BY: _____

RATIVE EXTRACT COC: RECIEVED BY: _____ DATE: _____

00135

LOCKHEED MARTIN

Lockheed Analytical Services

DAMES AND MOORE
CHEVRON

ANALYTICAL DATA REPORT

FOR

METALS, NITRATE, TOTAL DISSOLVED SOLIDS, ALKALINITY, CHLORIDE, SULFATE, VOLATILE AND SEMI VOLATILE ORGANICS

LOG-IN NUMBER: L7312

QUOTATION NUMBER: Q616320

DOCUMENT FILE NUMBER: 0625337

Lockheed Environmental Systems & Technologies Co.
Lockheed Analytical Services
975 Kelly Johnson Drive Las Vegas, Nevada 89119-3705
Telephone 702-361-0220 800-582-7605 Facsimile 702-361-8146

LOCKHEED MARTIN

July 22, 1996

Ms. Lynda Kelly
Dames and Moore
700 Folsum Blvd. Suite 200
Sacramento, CA 95826

RE: Log-in No.: L7312
Quotation No.: Q616320
Document File No.: 0625337

The attached data report contains the analytical results of samples that were submitted to Lockheed Analytical Services on 25 June 1996. The temperature of both coolers upon receipt were 3°C. The sample containers did not agree with the chain-of-custody documentation. All sample containers were not received intact. Samples were received in time to meet the analytical holding time requirements. All discrepancies (if applicable) identified upon receipt of the samples have been forwarded to the client and are documented in the enclosed chain-of-custody records. (See attached Sample Receiving Checklist for details).

The case narratives included in the following attachments provide a detailed description of all events that occurred during sample preparation, analysis, and data review specific to the samples and analytical methods requested.

A list of data qualifiers, chain-of-custody forms, sample receiving checklist, and log-in report are also enclosed representing the samples received within this group.

If you have any questions concerning the analysis or the data please call Mary B. Ford, Client Services Manager, at (702) 361-3955, extension 326.

Release of this data report has been authorized by the Laboratory Director or the Director's designee as evidenced by the following signature.

Sincerely,

Mary B. Ford 7/23/96

Mary B. Ford
Client Services Manager

cc: Client Services
Document Control

CASE NARRATIVE
INORGANIC NON METALS ANALYSES

The routine calibration and quality control analyses performed for this batch include as applicable: initial and continuing calibration verification, initial and continuing calibration blanks, method blank(s), laboratory control sample(s), matrix spike (predigestion) sample(s), duplicate sample(s).

Preparation and Analysis Requirements

All samples were received on June 25, 1996. The samples were logged in as L7312 and were prepared and analyzed in batch 624 dm, 624 dmx and 625 dm for:

A. Method 160.1 Total Dissolved Solids
B. Method 310.1 Alkalinity
C. Method 325.2 Chloride
D. Method 325.0 Nitrate-Nitrite as Nitrogen
E. Method 375.4 Sulfate

Holding Time Requirements

- All samples were analyzed within the method-specific holding times.

Method Blanks

- The concentration levels of all the requested analytes in the method blank were below the reporting detection limits.

Internal Quality Control

- All Internal Quality Control were within acceptance limits.

Samples

- For Method 300.0 Nitrate-Nitrite as Nitrogen for sample EBS-001 (L7312-36), although the client's chain of custody did not request this analysis, a sample was received labled "Nitrate". Therefore, an analysis was performed on this sample and the result is reported.

Kay McCann
Prepared By

July 5, 1996
Date

CASE NARRATIVE
INORGANIC METALS ANALYSES

The routine calibration and quality control analyses performed for this batch include as applicable: instrument tune (ICP/MS only), initial and continuing calibration verification, initial and continuing calibration blanks, method blank(s), laboratory control sample(s), ICP interference check samples (ICP only), serial dilutions, analytical (post-digestion) spike samples, matrix spike (predigestion) sample(s), and duplicate sample(s).

Preparation and Analysis Requirements

All samples were received on June 25, 1996. The samples were logged in as L7312 and were prepared and analyzed in batch 625 dm for total metals. The samples were analyzed by Method 7000 Furnace metals for arsenic and lead, Method 7470 Mercury, and Method 6010 ICP Metals for all other analytes.

Holding Time Requirements

- All samples were analyzed within the method-specific holding times.

Method Blanks

- The concentration levels of all the requested analytes in the method blank were below the reporting detection limits.

Internal Quality Control

- All Internal Quality Control were within acceptance limits.

Shellee McGrath
Prepared By

July 7, 1996
Date

CASE NARRATIVE
ORGANIC ANALYSES

Analytical Method 8260 Volatile Organics

The associated samples were analyzed in three analytical batches. All instrument tunes, initial and continuing calibrations were within QC criteria. Surrogate recoveries were within QC limits for all samples. The internal standard area counts and retention times were within QC limits for all samples.

Analytical Batch 062896-8260-J-2 (water)

Note: Sample C6-58 (L7305-4) was the native sample used for the MS and MSD analyzed as part of this analytical batch.

The client requested BTEX analysis only for these samples.

The samples were analyzed within holding time on June 28 and 29, 1996. No target compounds were detected in the Method Blank (38532MB). All spiked compound recoveries in 38532MS, 38532MSD and 38532LCS were within QC limits. The Relative Percent Differences between the spiked compound recoveries in 38532MS and 38532MSD were all within QC limits.

Analytical Batch 062996-8260-J-2 (water)

Note: Sample C6-R04 (L7305-31) was the native sample used for the MS and MSD analyzed as part of this analytical batch.

The samples were analyzed within holding time on June 29, 1996. The compound Acetone was detected in the Method Blank (38559MB) at a level of 4.1ug/L (practical quantitation limit of 10ug/L). If this compound is detected in any of the associated samples it will be flagged with a "B" qualifier. All spiked compound recoveries in 38559MS, 38559MSD and 38559LCS were within QC limits. The RPDs between the spiked compound recoveries in 38559MS and 38559MSD were all within QC limits.

Analytical Batch 063096-8260-J-2 (water)

Note: The samples 38559MS and 38559MSD that were analyzed as part of analytical batch 062996-8260-J-2 are associated with the samples in this analytical batch.

The samples were analyzed within holding time on June 30, 1996. No target compounds were detected in the Method Blank (38561MB). All spiked compound recoveries in 38561LCS were within QC limits.

Analytical Method 8270 Semi-Volatile Organics

The associated samples were analyzed in two analytical batches. The instrument tunes, inititial and continuing calibrations were all within QC limits. There were no target compounds detected in the Method Blanks (38495MB and 38495MB reanalyzed). The internal standard area counts and retention times were within QC limits for all samples.

Analytical Batch 070296-8270-K (water)

Note: Sample C6-RO4 (L7305-107) was the native sample used for 38495MS and 38495MSD analyzed as part of this analytical batch. Samples 38495MS and 38495MSD were analyzed using the duplicate samples C6-RO4 (L7305-108) and C6-RO4 (L7305-109), respectively.

Samples 38495MS, 38495MSD and 38495LCS contained several compounds in addition to the five (5) required spike compounds.

The samples were extracted within holding time on June 27, 1996 and analyzed within holding time on July 2, 1996. Surrogate recoveries were within QC limits for all samples except for 2-Fluorophenol in samples 38495MB and 2-Fluorophenol and Phenol-d5 in client sample B5-RO8 (L7312-27). Samples B5-RO8 (L7312-27) and 38495MB were reanalyzed in analytical batch 070396-8270-K with similar results. All analyses results were reported in this data package. The recoveries of the spiked compounds in 38495MS, 38495MSD and 38495LCS were all within QC limits (although the recoveries of 1,4-Dichlorobenzene, N-Nitroso-di-propylamine and 1,2,4-Trichlorobenzene were at the low end of the the QC limits in the MS). With the exception of 1,4-Dichlorobenzene, N-Nitroso-di-n-propylamine and 1,2,4-Trichlorobenzene, the RPDs between the recoveries of the spiked compounds in 38495MS and 38495MSD were within QC limits.

Analytical Batch 070396-8270-K (water)

Note: Refer to analytical batch 070296-8270-K (water) for the associated QC (38495MS, 38495MSD and 38495LCS) results.

The samples were extracted within holding time on June 27, 1996 and analyzed within holding time on July 3, 1996. Surrogate recoveries were within QC limits for all samples except for 2-Fluorophenol in the reanalyzed client sample B5-RO8 (L7312-27) and 38495MB reported in this data package.

Analytical Method 8270 PAH by Selective Ion Monitoring

The associated samples were analyzed in two analytical batches. All instrument tunes, initial and continuing calibrations were within QC criteria. No target compounds were detected in either of the Method Blank (38524MB). All internal standard area counts and retention times were within QC limits.

Analytical Batch 070196-8270-L (water)

The samples were extracted within holding time on June 28, 1996 and analyzed within holding time on July 1, 1996. All surrogate recoveries were within QC limits with the exception of Nitrobenzene-d5 in 38524LCSDUP. This sample was reanalyzed in analytical batch 070296-8270-L with similar results. Due to insufficient sample volume a LCS and LCSDUP (38524LCS and 38524LCSDUP) were prepared in place of a MS and MSD. All spiked compound recoveries were within QC limits except for Naphthalene in 38524LCSDUP. The Relative Percent Differences between the spiked compound recoveries in 38524LCS and 38524LCSDUP were all within QC limits except for Naphthalene. The level of the compound Acenaphthene detected in client sample C4-76 (L7312-29) exceeded the calibration range. This sample was reanalyzed in analytical batch 070296-8270-L and the results reported as part of this data package.

Analytical Batch 070296-8270-L (water)

The samples were extracted within holding time on June 28, 1996 and analyzed within holding time on July 2, 1996. All surrogate recoveries were within QC limits with the exception of Nitrobenzene-d5 in 38524LCSDUP. This sample was previously analyzed as part of analytical batch 070196-8270-L with similar results. Both sets of results will be reported as part of this data package. All of the spiked compound recoveries in the reanalyzed 38524LCSDUP were within QC limits except for Naphthalene. Again, this sample was previously analyzed as part of analytical batch 070196-8270-L with similar results. Both sets of results will be reported as part of this data package. Sample C4-76 (L7312-29) was diluted and reanalyzed as part of this analytical batch. The level of Acenaphthene detected in the sample was within the calibration range. Both sets of data will be reported.

Donald A. Hilke
Prepared By

July 22, 1996
Date

Lockheed Analytical Services

DATA QUALIFIERS FOR INORGANIC ANALYSES

[Revised 08/28/92]

For Use on the Analytical Data Reporting Forms	
B	***For CLP Analyses Only*** – Reported value is less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).
C	***For Routine, Non-CLP Analyses Only*** – Any constituent that was also detected in the associated blank whose concentration was greater than the reporting detection limit (RDL).
D	Presence of high levels of interfering constituents required dilution of sample which increased the RDL by the dilution factor.
E	Estimated value due to presence of interference.
H	Sample analysis performed outside of method-or client-specified maximum holding time requirement.
M	***For CLP Analyses Only*** – Duplicate injection precision criterion was not met.
N1	Matrix spike recovery exceeded acceptance limits.
S	Reported value was determined from the method of standard addition.
U	***For CLP Reporting Only*** – Constituent was analyzed for but not detected (sample quantitation must be corrected for dilution and percent moisture).
W	***For AAS Only*** – Post-digestion spike for Furnace AAS did not meet acceptance criteria and sample absorbance is less than 50% of spike absorbance.
X, Y, or Z	Analyst-defined qualifier.
*	Relative percent difference (RPD) for duplicate analysis exceeded acceptance limits.
+	Correlation coefficient (r) for the MSA is less than 0.995.
For Use on the QC Data Reporting Forms	
a[1]	The spike recovery and/or RPD for matrix spike and matrix spike duplicates cannot be evaluated due to insufficient spiking level compared to the elevated sample analyte concentration.
b[1]	The RPD cannot be computed because the sample and/or duplicate concentration was below the RDL.

[1] Used as footnote designations on the QC summary form.

Lockheed Analytical Services
DATA QUALIFIERS FOR ORGANIC ANALYSES

[Revised 02/09/1996]

For Use On The Analytical Data Reporting Forms	
A	***For CLP analyses Only*** -- The TIC is a suspected aldol-condensation product.
B	Any constituent that was also detected in the associated blank whose concentration was greater than the practical or reporting detection limit (PQL or RDL).
C	Constituent confirmed by GC/MS analysis. *[pesticide/PCB analyses only]*
D	Constituent detected in the diluted sample. It also indicates that an accurate quantitation is not possible due to surrogates being diluted out of the samples during the course of the analysis.
E	Constituent concentration exceeded the calibration range.
G	The quantitation is not gasoline or diesel but believed to be some other combination of hydrocarbons.
H	Sample analysis performed outside of method- or client-specified maximum holding time requirement.
J	*Estimated value* -- (1) constituent detected at a level less than the RDL or PQL and greater than or equal to the MDL; (2) estimated concentration for TICs ***(For CLP Reporting Only)***.
N	***For CLP Reporting Only*** -- Tentatively identified constituents (TICs) identified based on mass spectral library search.
NQ	Analyte detected, but Not Quantified; see result from subsequent analysis
P	***For CLP Reporting Only*** -- The percent difference between the concentrations detected on both GC columns was greater than 25 percent *[pesticide/PCB analyses only]*.
U	***For CLP Reporting Only*** -- Constituent was analyzed for but not detected (sample quantitation must be corrected for dilution and percent moisture).
X, Y, or Z	Analyst-defined qualifier.
N/A (% Moisture)	N/A in the % moisture cell indicates that data are reported on an "*as received*" basis. A value in the % moisture cell indicates that data are reported based on a "*dry weight*" basis.
For Use On The QC Data Reporting Forms	
*	QC data (i.e., percent recovery data for matrix spike, matrix spike duplicate, laboratory control standard, or surrogates; and RPD for matrix spike duplicate or unspiked duplicate) exceeded acceptance limits.
ad a[1]	The spike recovery and/or RPD for matrix spike and matrix spike duplicates cannot be evaluated due to insufficient spiking level compared to the elevated sample analyte concentration.
b[1]	The RPD cannot be computed because the sample and/or duplicate concentration was below the RDL.

[1] Used as footnote designations on the QC Summary Form.

L7312

SAMPLE LOGIN AND CHAIN OF CUSTODY

Revised login

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:36 pm

Login Number: L7312
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory -- Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7312-1	C4-76	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
Water 1 S 8260	VOLATILES	Hold: 08-JUL-96			
L7312-2	C4-76	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
L7312-3	C4-76	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
L7312-4	C3-65	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
Water 1 S 8260	VOLATILES	Hold: 08-JUL-96			
L7312-5	C3-65	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
L7312-6	C3-65	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
L7312-7	B8-D2	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
Water 1 S 8260	VOLATILES	Hold: 08-JUL-96			
L7312-8	B8-D2	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
L7312-9	B8-D2	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
L7312-10	TBS-004	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
Water 1 S 8260	VOLATILES	Hold: 08-JUL-96			

* sample L7312-20 C4-76 has been logged in for Intrinsics.
6/27/96 MK

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:36 pm

Login Number: L7312
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory -- Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7312-11	TBS-004	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
L7312-12	TBS-004	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
L7312-13	EBS-001	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "BTEX ONLY"					
Location: RFG18-50A3					
Water 1 S 8260	VOLATILES	Hold:08-JUL-96			
L7312-14	EBS-001	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "BTEX ONLY"					
Location: RFG18-50A3					
L7312-15	EBS-001	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "BTEX ONLY"					
Location: RFG18-50A3					
L7312-16	B5-R08	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
Water 1 S 8260	VOLATILES	Hold:08-JUL-96			
L7312-17	B5-R08	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
L7312-18	B5-R08	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
L7312-19	C4-76	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "J" FLAG FOR 8270 SEMI-VOA's"					
Location: RFG02-39B					
Water 1 S 8270	SEMI-VOLATILES	Hold:01-JUL-96			
L7312-20	C4-76	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "J" FLAG FOR 8270 SEMI-VOA's"					
Location: RFG02-39B					
Water 1 S 160.1	TDS	Hold:01-JUL-96			
Water 1 S 310.1	ALKALINITY	Hold:08-JUL-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:36 pm

Login Number: L7312
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
Water 1 S 325.2 CHLORIDE		Hold:22-JUL-96			
Water 1 S 375.4 SULFATE		Hold:22-JUL-96			
L7312-21	C3-65	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "J" FLAG FOR 8270 SEMI-VOA's"					
Location: RFG02-39B					
Water 1 S 8270 SEMI-VOLATILES		Hold:01-JUL-96			
L7312-22	C3-65	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "J" FLAG FOR 8270 SEMI-VOA's"					
Location: RFG02-39B					
L7312-23	B8-D2	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "J" FLAG FOR 8270 SEMI-VOA's"					
Location: RFG02-39B					
Water 1 S 8270 SEMI-VOLATILES		Hold:01-JUL-96			
L7312-24	B8-D2	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "J" FLAG FOR 8270 SEMI-VOA's"					
Location: RFG02-39B					
L7312-25	EBS-001	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "PAH ONLY"					
Location: RFG02-39B					
Water 1 S 8270 SIM		Hold:01-JUL-96			
L7312-26	EBS-001	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "PAH ONLY"					
Location: RFG02-39B					
L7312-27	B5-R08	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "J" FLAG FOR 8270 SEMI-VOA's"					
Location: RFG02-39B					
Water 1 S 8270 SEMI-VOLATILES		Hold:01-JUL-96			
L7312-28	B5-R08	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "J" FLAG FOR 8270 SEMI-VOA's"					
Location: RFG02-39B					
L7312-29	C4-76	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "PAH ONLY"					
Location: RFG02-39B					
Water 1 S 8270 SIM		Hold:01-JUL-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:36 pm

Login Number: L7312
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7312-30	C3-65	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "PAH ONLY"					
Location: RFG02-39B					
Water 1 S 8270 SIM		Hold: 01-JUL-96			
L7312-31	B8-D2	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "PAH ONLY"					
Location: RFG02-39B					
Water 1 S 8270 SIM		Hold: 01-JUL-96			
L7312-32	B5-R08	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "PAH ONLY"					
Location: RFG02-39B					
Water 1 S 8270 SIM		Hold: 01-JUL-96			
L7312-33	C4-76	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: 121					
Water 1 S 353.2 NITRATE		Hold: 22-JUL-96			
L7312-34	C3-65	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: 121					
Water 1 S 353.2 NITRATE		Hold: 22-JUL-96			
L7312-35	B8-D2	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: 121					
Water 1 S 353.2 NITRATE		Hold: 22-JUL-96			
L7312-36	EBS-001	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: 121					
Water 1 S 353.2 NITRATE		Hold: 22-JUL-96			
L7312-37	B5-R08	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: 121					
Water 1 S 353.2 NITRATE		Hold: 22-JUL-96			
L7312-38	C3-65	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "METALS=As,Cd,Cr,Pb,Ni,V"					
Location: RFG02-39C					
Water 1 S 6010 ICP METALS		Hold: 21-DEC-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:36 pm

Login Number: L7312
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number			Client Sample Number		Collect Date	Receive Date	PR	Due Date
Water	1	S	6010	ICP TRACE	Hold:21-DEC-96			
Water	1	S	7000	FURNACE METALS	Hold:21-DEC-96			
Water	1	S	7470	MERCURY	Hold:22-JUL-96			
L7312-39				B8-D2	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "METALS=As,Cd,Cr,Pb,Ni,V"								
Location: RFG02-39C								
Water	1	S	6010	ICP METALS	Hold:21-DEC-96			
Water	1	S	6010	ICP TRACE	Hold:21-DEC-96			
Water	1	S	7000	FURNACE METALS	Hold:21-DEC-96			
Water	1	S	7470	MERCURY	Hold:22-JUL-96			
L7312-40				B5-R08	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "METALS=As,Cd,Cr,Pb,Ni,V"								
Location: RFG02-39C								
Water	1	S	6010	ICP METALS	Hold:21-DEC-96			
Water	1	S	6010	ICP TRACE	Hold:21-DEC-96			
Water	1	S	7000	FURNACE METALS	Hold:21-DEC-96			
Water	1	S	7470	MERCURY	Hold:22-JUL-96			
L7312-41				C3-65	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3								
Location: 133								
Water	1	S	160.1	TDS	Hold:01-JUL-96			
Water	1	S	310.1	ALKALINITY	Hold:08-JUL-96			
Water	1	S	325.2	CHLORIDE	Hold:22-JUL-96			
Water	1	S	375.4	SULFATE	Hold:22-JUL-96			
L7312-42				B8-D2	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3								
Location: 133								
Water	1	S	160.1	TDS	Hold:01-JUL-96			
Water	1	S	310.1	ALKALINITY	Hold:08-JUL-96			
Water	1	S	325.2	CHLORIDE	Hold:22-JUL-96			
Water	1	S	375.4	SULFATE	Hold:22-JUL-96			
L7312-43				B5-R08	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3								
Location: 133								
Water	1	S	160.1	TDS	Hold:01-JUL-96			
Water	1	S	310.1	ALKALINITY	Hold:08-JUL-96			
Water	1	S	325.2	CHLORIDE	Hold:22-JUL-96			
Water	1	S	375.4	SULFATE	Hold:22-JUL-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 27 1996, 01:36 pm

Login Number: L7312
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number			Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7312-44			REPORT TYPE	25-JUN-96	25-JUN-96		05-JUL-96
Location:							
Water	1	S	EDD - DISK DEL.				
Water	1	S	FORD				
Water	1	S	GCMS2				
Water	1	S	INORG TYPE 2 RPT				

Signature: Mary B. Ford

Date: 6/27/96

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 25 1996, 04:33 pm

OK WDF 6/27/96

Login Number: L7312
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory -- Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7312-1	C4-76 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
Water 1 S 8260	VOLATILES	Hold:08-JUL-96			
L7312-2	C4-76	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
L7312-3	C4-76	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
L7312-4	C3-65 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
Water 1 S 8260	VOLATILES	Hold:08-JUL-96			
L7312-5	C3-65	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
L7312-6	C3-65	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
L7312-7	B8-D2 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
Water 1 S 8260	VOLATILES	Hold:08-JUL-96			
L7312-8	B8-D2	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
L7312-9	B8-D2	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
L7312-10	TBS-004 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
Water 1 S 8260	VOLATILES	Hold:08-JUL-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 25 1996, 04:33 pm

Login Number: L7312
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7312-11	TBS-004	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
L7312-12	TBS-004	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
L7312-13	EBS-001 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "BTEX ONLY"					
Location: RFG18-50A3					
Water 1 S 8260	VOLATILES	Hold: 08-JUL-96			
L7312-14	EBS-001	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "BTEX ONLY"					
Location: RFG18-50A3					
L7312-15	EBS-001	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "BTEX ONLY"					
Location: RFG18-50A3					
L7312-16	B5-R08 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
Water 1 S 8260	VOLATILES	Hold: 08-JUL-96			
L7312-17	B5-R08	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
L7312-18	B5-R08	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG18-50A3					
L7312-19	C4-76 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "J" FLAG FOR 8270 SEMI-VOA's"					
Location: RFG02-39B					
Water 1 S 8270	SEMI-VOLATILES	Hold: 01-JUL-96			
L7312-20	C4-76	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "J" FLAG FOR 8270 SEMI-VOA's"					
Location: RFG02-39B					

* can we use this container for Intrinsic Analyses?! YES. MBF

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 25 1996, 04:33 pm

Login Number: L7312
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory -- Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7312-21	C3-65 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "J" FLAG FOR 8270 SEMI-VOA's"					
Location: RFG02-39B					
Water 1 S 8270 SEMI-VOLATILES		Hold:01-JUL-96			
L7312-22	C3-65	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "J" FLAG FOR 8270 SEMI-VOA's"					
Location: RFG02-39B					
L7312-23	B8-D2 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "J" FLAG FOR 8270 SEMI-VOA's"					
Location: RFG02-39B					
Water 1 S 8270 SEMI-VOLATILES		Hold:01-JUL-96			
L7312-24	B8-D2	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "J" FLAG FOR 8270 SEMI-VOA's"					
Location: RFG02-39B					
L7312-25	EBS-001 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "PAH ONLY"					
Location: RFG02-39B					
Water 1 S 8270 SIM		Hold:01-JUL-96			
L7312-26	EBS-001	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "PAH ONLY"					
Location: RFG02-39B					
L7312-27	B5-R08 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "J" FLAG FOR 8270 SEMI-VOA's"					
Location: RFG02-39B					
Water 1 S 8270 SEMI-VOLATILES		Hold:01-JUL-96			
L7312-28	B5-R08	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "J" FLAG FOR 8270 SEMI-VOA's"					
Location: RFG02-39B					
L7312-29	C4-76 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "PAH ONLY"					
Location: RFG02-39B					
Water 1 S 8270 SIM		Hold:01-JUL-96			
L7312-30	C3-65 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "PAH ONLY"					
Location: RFG02-39B					

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 25 1996, 04:33 pm

Login Number: L7312
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
Water 1 S 8270 SIM		Hold:01-JUL-96			
L7312-31	B8-D2 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "PAH ONLY"					
Location: RFG02-39B					
Water 1 S 8270 SIM		Hold:01-JUL-96			
L7312-32	B5-R08 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "PAH ONLY"					
Location: RFG02-39B					
Water 1 S 8270 SIM		Hold:01-JUL-96			
L7312-33	C4-76 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG02-39B					
Water 1 S 353.2 NITRATE		Hold:22-JUL-96			
L7312-34	C3-65 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG02-39B					
Water 1 S 353.2 NITRATE		Hold:22-JUL-96			
L7312-35	B8-D2 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG02-39B					
Water 1 S 353.2 NITRATE		Hold:22-JUL-96			
L7312-36	EBS-001	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG02-39B					
Water 1 S 353.2 NITRATE		Hold:22-JUL-96			
Sample Not on the COC. 6/27/96 MBF					
L7312-37	B5-R08 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG02-39B					
Water 1 S 353.2 NITRATE		Hold:22-JUL-96			
L7312-38	C3-65 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "METALS=As,Cd,Cr,Pb,Ni,V"					
Location: RFG02-39C					
Water 1 S 6010 ICP METALS		Hold:21-DEC-96			
Water 1 S 6010 ICP TRACE		Hold:21-DEC-96			
Water 1 S 7470 MERCURY		Hold:22-JUL-96			

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 25 1996, 04:33 pm

Login Number: L7312
Account: 337 Dames & Moore * Sacramento, CA
Project: CHEVRON '96

Laboratory -- Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L7312-39	B8-D2 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "METALS=As,Cd,Cr,Pb,Ni,V"					
Location: RFG02-39C					
Water 1 S 6010 ICP METALS		Hold:21-DEC-96			
Water 1 S 6010 ICP TRACE		Hold:21-DEC-96			
Water 1 S 7470 MERCURY		Hold:22-JUL-96			
L7312-40	B5-R08 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3 "METALS=As,Cd,Cr,Pb,Ni,V"					
Location: RFG02-39C					
Water 1 S 6010 ICP METALS		Hold:21-DEC-96			
Water 1 S 6010 ICP TRACE		Hold:21-DEC-96			
Water 1 S 7470 MERCURY		Hold:22-JUL-96			
L7312-41	C3-65 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG02-39C					
Water 1 S 160.1 TDS		Hold:01-JUL-96			
Water 1 S 310.1 ALKALINITY		Hold:08-JUL-96			
Water 1 S 325.2 CHLORIDE		Hold:22-JUL-96			
Water 1 S 375.4 SULFATE		Hold:22-JUL-96			
L7312-42	B8-D2 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG02-39C					
Water 1 S 160.1 TDS		Hold:01-JUL-96			
Water 1 S 310.1 ALKALINITY		Hold:08-JUL-96			
Water 1 S 325.2 CHLORIDE		Hold:22-JUL-96			
Water 1 S 375.4 SULFATE		Hold:22-JUL-96			
L7312-43	B5-R08 ✓	24-JUN-96	25-JUN-96		05-JUL-96
TEMP 3					
Location: RFG02-39C					
Water 1 S 160.1 TDS		Hold:01-JUL-96			
Water 1 S 310.1 ALKALINITY		Hold:08-JUL-96			
Water 1 S 325.2 CHLORIDE		Hold:22-JUL-96			
Water 1 S 375.4 SULFATE		Hold:22-JUL-96			
L7312-44	REPORT TYPE	25-JUN-96	25-JUN-96		05-JUL-96
Location:					
Water 1 S EDD - DISK DEL.					
Water 1 S FORD					
Water 1 S GCMS2					
Water 1 S INORG TYPE 2 RPT					

Signature: Paul C Dames

Date: 6-25-96

L7312 16

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Sample Number	Depth	Time	Sample Type	Container Type	HVOCs 601/8010	BTE Only 602/8020	VOCs ~~624/8240~~ 8260	SVOCs 625/8270	TRPH 418.1	TPH 8015(M)-G	TPH 8015(M)-D	PCBs 8080	Total Pb/Cd 6010	PAHs ~~8100~~ 8310	TCLP	BTEX 8260	Metals	Intrinsic	Nitrate 353.2	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
CA-76		1040	Water	40ml VOA			X													w/ HCl	3	
↓		↓	↓	1L glass amber				X						X							3	
↓		↓	↓	1L poly													X			w/ HNO_3	1	
↓		↓	↓	1L poly														X			1	
↓		↓	↓	500ml poly															X	w/ H_2SO_4	1	
C3-65		0910	Water	40ml VOA			X													w/ HCl	3	
↓		↓	↓	1L glass amber				X						X							3	
↓		↓	↓	1L poly													X			w/ HNO_3	1	
↓		↓	↓	1L poly														X			1	
↓		↓	↓	500ml poly															X	w/ H_2SO_4	1	
B8-D2		1110	Water	40ml VOA			X													w/ HCl	3	
↓		↓	↓	1L glass amber				X						X							3	
↓		↓	↓	1L poly													X			w/ HNO_3	1	
↓		↓	↓	1L poly														X			1	
↓		↓	↓	500ml poly															X	w/ H_2SO_4	1	
TBS-004		1415	Water	40ml VOA			X													w/ HCl	3	
EBS-001		1430	Water	40ml VOA												X				w/ HCl	3	
↓		↓	↓	1L glass amber										X							2	

(CA-76 Metals / Intrinsic / Nitrate rows annotated: – Sample lost in transit – 6/27/96 msr)

RELINQUISHED BY: (Signature) [signature] / M. [signature] DATE/TIME 6/24/96 1730 RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME 6-25-96/1520 RECEIVED BY: (Signature) [signature]

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES:
Metals: Arsenic, cadmium, lead, mercury, nickel & vanadium
Intrinsic: Alkalinity (310.2), Sulfate (375.4), TDS (160.1), Chloride (300 / 325.3)

ANALYTICAL LABORATORY Lockheed Analytical

LABORATORY CONTACT Mary Ford

D&M CONTACT Ed Tschupp PHONE: (808) 593-1116 x42

JOB NO.: 16000-533-037 SHEET 1 OF 2

PROJECT Dissolved Phase Investigation

LOCATION Chevron Hawaii Refinery

COLLECTOR DATE OF COLLECTION 6/24/96

DAMES & MOORE
1050 QUEEN STREET, SUITE 204
HONOLULU, HAWAII 96814
(808) 593-1116 FAX: (808) 593-1198

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Sample Number	Depth	Time	Sample Type	Container Type	HVOCs 601/8010	BTE Only 602/8020	VOCs ~~624/8240~~ 8240	SVOCs 625/8270	TRPH 418.1	TPH 8015(M)-G	TPH 8015(M)-D	PCBs 8080	Total Pb/Cd 6010	PAHs ~~8100~~ 8310	TCLP	BTEX 8260	metals	Intrinsic	Nitrate ~~N~~ 353.2	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
EBS-001		1430	Water	1 L poly												X				w/HNO3	1	
B5-R08		1410	Water	40 ml VOA		X														w/HCl	3	
↓		↓	↓	1 L glass amber			X						X								3	
				1 L poly												X				w/HNO3	1	
				1 L poly													X				1	
				500 ml poly														X		w/H2SO4	1	

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)
Zenji Sh / M. Dalud 6/24/96 1730

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)
6-25-96/1500

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY Lockheed Analytical

LABORATORY CONTACT Mary Ford

D&M CONTACT Ed Tschupp PHONE: ext. 42

DAMES & MOORE
1050 QUEEN STREET, SUITE 204
HONOLULU, HAWAII 96814
(808) 593-1116 FAX: (808) 593-1198

LABORATORY NOTES:

See page 1

JOB NO.: 16000-533-037 SHEET 2 OF 2

PROJECT Dissolved Phase Investigation

LOCATION Chevron Hawaii Refinery

COLLECTOR DATE OF COLLECTION 6/24/96

LOCKHEED MARTIN

Sample Login
Login Review Checklist

Lot Number 12312

The login review should be conducted by that person logging in the samples as well as a peer. Please use this checklist to ensure that such reviews occur in a uniform basis. Please sign and date below to verify that a login review has occurred. This checklist should be affixed to each login package prior to distribution.

For effective login review, at a minimum, five reports form the login process are required. These are the COC (or equivalent), the login COC report, the sample summary report, the sample receiving checklist, and the login quotation. Before beginning review, ensure that these five components are available. Jobs with single component samples, the sample summary report may be omitted.

SAMPLE SUMMARY REPORT	YES	NO	N/A	Comment
1. Are all sample ID's correct?	X			
2. Are all samples present?	X			
3. Are all matrices indicated correctly?	X			
4. Are all analyses on the COC logged in for the appropriate samples?	X			
5. Are all analyses logged in for the correct container?	X			
6. Are samples logged in according to LAS batching procedures?	X			

LOGIN CHAIN OF CUSTODY	YES	NO	N/A	Comment
1. Are the collect, receive, and due dates correct for every sample?	X			
2. Have all appropriate comments been indicated in the comment section?	X			

SAMPLE RECEIVING CHECKLIST	YES	NO	N/A	Comment
1. Are all discrepancies between the COC and the login noted (if applicable)?			X	

Paula Jones 6-25-96
primary review signature date

A Smith 6:25 PM
secondary review signature date

ockheed / lytical Services

ample Receiving Checklist

lent Name: Dames & Moore Job No. 7312 Cooler ID: 6823

OOLER CONDITION UPON RECEIPT			
mperature of cooler upon receipt:	3 °C		
nperature of temp. blank upon receipt:	—		
	Yes	No	* Comments/Discrepancies
stody seals intact	X		
ain of custody present	X		
ue ice (or equiv.) present/frozen	X		
l survey completed	X		

AMPLE CONDITION UPON RECEIPT			
	Yes	No	* Comments/Discrepancies
bottles labeled	X		
nples intact		X	[illegible]
oper container used for sample type	X		[illegible]
mple volume sufficient for analysis	X		[illegible]
oper pres. indicated on the COC	X		
OA's contain headspace		n/a	
samples bi-phasic (if so, indicate sample ID'S):		n/a	

ISCELLANEOUS ITEMS			
	Yes	No	* Comments/Discrepancies
nples with short holding times		X	
nples to subcontract		n/a	

DDITIONAL COMMENTS/DISCREPANCIES [illegible] on the C.O.C. # EBS-CO1 (7312-30) [illegible] EBS-CCl [illegible] metals [illegible] 6-25-96

mpleted by / date: [illegible] 6-25-96

nt to the client (date/initials): OK MBF 6/27/96 ** Client's signature upon receipt:

*es: * = contact the appropriate CSR of any discrepancies immediately upon receipt*

*** please review this information and return via facsimille to the appropriate CSR (702) 361-8146*

rsion 2.0 (11/11/94)

Lockheed lytical Services
Sample Receiving Checklist

Client Name: Dames & Moore Job No. Cooler ID: 68100

COOLER CONDITION UPON RECEIPT

Temperature of cooler upon receipt: 3 °C

Temperature of temp. blank upon receipt:

	Yes	No	* Comments/Discrepancies
Custody seals intact	X		
Chain of custody present	X		
Blue ice (or equiv.) present/frozen	X		
Rad survey completed	X		

SAMPLE CONDITION UPON RECEIPT

	Yes	No	* Comments/Discrepancies
All bottles labeled	X		
Samples intact	X		
Proper container used for sample type	X		
Sample volume sufficient for analysis	X		
Proper pres. indicated on the COC	X		
VOA's contain headspace			
Are samples bi-phasic (if so, indicate sample ID'S):			

MISCELLANEOUS ITEMS

	Yes	No	* Comments/Discrepancies
Samples with short holding times		X	
Samples to subcontract		—	

ADDITIONAL COMMENTS/DISCREPANCIES

Completed by / date:

Sent to the client (date/initials): OK MSF 6/27/96 ** Client's signature upon receipt:

Notes: * = contact the appropriate CSR of any discrepancies immediately upon receipt

** = please review this information and return via facsimille to the appropriate CSR (702) 361-8146

MESSAGE CONFIRMATION

06/28/96 05:57

SESSION NO. = 814

ID=LOCKHEED ANALYTICAL SERVICES

DATE	TIME	S,R-TIME	DISTANT STATION ID	MODE	PAGES	RESULT	
06/28	06:48	08'53"	808 593 1198	ECM-S	11	OK	0000

LOCKHEED MARTIN

Lockheed Analytical Services
975 Kelly Johnson Drive
Las Vegas, NV 89119

702 361-3955 ext. 326
fax 702 361-8146

FAX TRANSMITTAL COVER

Date: 6/27/96

Number of Pages (including cover) 11

To: Ed Tschupp Company Name: D&M

Phone: 808-593-1116 x42

Fax: 808-593-1198

Confirmation of sample receipt L7312.
B4-61 ~~from~~ intrinsic analyses are taken from 1 of the unpres. amber bottles.

C4-76 - both the metals + intrinsic containers lost their lids. The intrinsics are being analyzed from the extra 1 L unpres. amber. The metals are not salvageable.

Please call if you have any questions.

Mary

From: Mary B. Ford
Client Services Manager
Phone: (702) 361-3955 ext 326.
Fax: (702) 361-8146

Lockheed Analytical Laboratory
SAMPLE SUMMARY REPORT (su02)
Dames & Moore * Sacramento, CA

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method
B5-R08	L7312-16		Water	8260 VOLATILES
	L7312-27		Water	8270 SEMI-VOLATIL
	L7312-32		Water	8270 SIM
	L7312-37		Water	353.2 NITRATE
	L7312-40		Water	6010 ICP METALS
	L7312-40		Water	6010 ICP TRACE
	L7312-40		Water	7470 MERCURY
	L7312-43		Water	160.1 TDS
	L7312-43		Water	310.1 ALKALINITY
	L7312-43		Water	325.2 CHLORIDE
	L7312-43		Water	375.4 SULFATE
B8-D2	L7312-7		Water	8260 VOLATILES
	L7312-23		Water	8270 SEMI-VOLATI
	L7312-31		Water	8270 SIM
	L7312-35		Water	353.2 NITRATE
	L7312-39		Water	6010 ICP METALS
	L7312-39		Water	6010 ICP TRACE
	L7312-39		Water	7470 MERCURY
	L7312-42		Water	160.1 TDS
	L7312-42		Water	310.1 ALKALINITY
	L7312-42		Water	325.2 CHLORIDE
	L7312-42		Water	375.4 SULFATE
C3-65	L7312-4		Water	8260 VOLATILES
	L7312-21		Water	8270 SEMI-VOLATI
	L7312-30		Water	8270 SIM
	L7312-34		Water	353.2 NITRATE
	L7312-38		Water	6010 ICP METALS
	L7312-38		Water	6010 ICP TRACE
	L7312-38		Water	7470 MERCURY
	L7312-41		Water	160.1 TDS
	L7312-41		Water	310.1 ALKALINITY
	L7312-41		Water	325.2 CHLORIDE
	L7312-41		Water	375.4 SULFATE
C4-76	L7312-1		Water	8260 VOLATILES
	L7312-19		Water	8270 SEMI-VOLATI
	L7312-29		Water	8270 SIM
	L7312-33		Water	353.2 NITRATE
EBS-001	L7312-13		Water	8260 VOLATILES
	L7312-25		Water	8270 SIM
	L7312-36		Water	353.2 NITRATE
REPORT TYPE	L7312-44		Water	EDD - DISK DEL.
	L7312-44		Water	FORD
	L7312-44		Water	GCMS2
	L7312-44		Water	INORG TYPE 2 RPT
TBS-004	L7312-10		Water	8260 VOLATILES

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Sample Number	Depth	Time	Sample Type	Container Type	HVOCs 601/8010	BTE Only 602/8020	VOCs ~~624/8240~~ 8240	SVOCs 625/8270	TRPH 418.1	TPH 8015(M)-G	TPH 8015(M)-D	PCBs 8080	Total Pb/Cd 6010	PAHs ~~8100~~ 8310	TCLP	BTEX 8260	Metals	Intrinsic	Nitrate 353.2	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
EBS-001		1430	water	1 L poly												X				w/HNO3	1	
BS-R08		1410	Water	40 ml VOA			X													w/HCl	3	
				1 Lglass amber				X				X									3	
				1 L poly												X				w/HNO3	1	
				1 L poly													X				1	
				500 ml poly														X		w/H2SO4	1	

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)
[signature] / [signature] 6/24/96 1730

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)
6/25/96 1500 [signature]

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY: Lockheed Analytical

LABORATORY CONTACT: Mary Ford

D&M CONTACT: Ed Tschupp PHONE: ext. 42

LABORATORY NOTES:

See page 1

JOB NO.: 16000-533-037 SHEET 2 OF 2

PROJECT: Dissolved Phase Investigation

LOCATION: Chevron Hawaii Refinery

COLLECTOR: _____ DATE OF COLLECTION: 6/24/96

DAMES & MOORE
1050 QUEEN STREET, SUITE 204
HONOLULU, HAWAII 96814
(808) 593-1116 FAX: (808) 593-1198

CHAIN-OF-CUSTODY RECORD

L7312 — 16

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Sample Number	Depth	Time	Sample Type	Container Type	HVOCs 601/8010	BTE Only 602/8020	VOCs ~~624/8240~~ 8240	SVOCs 625/8270	TRPH 418.1	TPH 8015(M)-G	TPH 8015(M)-D	PCBs 8080	Total Pb/Cd 6010	PAHs ~~8100~~ 8310	TCLP	BTEX 8260	Metals	Intrinsic	Nitrate 353.2	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
CA-76		1040	Water	40ml VOA			X													w/HCl	3	
↓		↓	↓	1L glass amber				X					X								3	
				1L poly												X				w/HNO_3	1	
				1L poly													X				1	
				500ml poly														X		w/H_2SO_4	1	
C3-65		0910	Water	40ml VOA			X													w/HCl	3	
↓		↓	↓	1L glass amber				X					X								3	
				1L poly												X				w/HNO_3	1	
				1L poly													X				1	
				500ml poly														X		w/H_2SO_4	1	
BB-D2		1110	Water	40ml VOA			X													w/HCl	3	
↓		↓	↓	1L glass amber				X					X								3	
				1L poly												X				w/HNO_3	1	
				1L poly													X				1	
				500ml poly														X		w/H_2SO_4	1	
TBS-004		1415	Water	40 ml VOA			X													w/HCl	3	
EBS-001		1430	Water	40ml VOA											X					w/HCl	3	
↓		↓	↓	1L glass amber									X								2	

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)
[signature] / M. DeA 6/24/96 1730

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)
6/25 96/1510 [signature]

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES:
Metals: Arsenic, cadmium, lead, mercury, nickel & vanadium
Intrinsic: Alkalinity (310.2), Sulfate (375.4), TDS (160.1), Chloride (300/325.3)

ANALYTICAL LABORATORY: Lockheed Analytical

LABORATORY CONTACT: Mary Ford

D&M CONTACT: Ed Tschupp PHONE: (808)593-1116 X42

JOB NO.: 16000-533-037 SHEET 1 OF 2

PROJECT: Dissolved Phase Investigation

LOCATION: Chevron Hawaii Refinery

COLLECTOR: _____ DATE OF COLLECTION: 6/24/96

DAMES & MOORE
1050 QUEEN STREET, SUITE 204
HONOLULU, HAWAII 96814
(808) 593-1116 FAX: (808) 593-1198

NON-METALS

WATER

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: C4-76	Date Collected: 24-JUN-96
Matrix: Water	Date Received: 25-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	2400	20.		28-JUN-96	38507	L7312-20
Alkalinity, total (as CaCO3)	mg/L	310.1	330	10.		02-JUL-96	38506	L7312-20
Chloride	mg/L	325.2	900	100	D(1:100)	01-JUL-96	38504	L7312-20
Nitrate-Nitrite-Nitrogen	mg/L	353.2	0.14	0.050		26-JUN-96	38435	L7312-33
SULFATE	mg/L	375.4	120	25.	D(1:5)	03-JUL-96	38505	L7312-20

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: EBS-001	Date Collected: 24-JUN-96
Matrix: Water	Date Received: 25-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Nitrate-Nitrite-Nitrogen	mg/L	353.2	550	5.0	D(1:100)	26-JUN-96	38435	L7312-36

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: C3-65	Date Collected: 24-JUN-96
Matrix: Water	Date Received: 25-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	2000	20.		27-JUN-96	38472	L7312-41
Alkalinity, total (as CaCO3)	mg/L	310.1	320	10.		28-JUN-96	38432	L7312-41
Chloride	mg/L	325.2	1000	100	D(1:100)	01-JUL-96	38433	L7312-41
Nitrate-Nitrite-Nitrogen	mg/L	353.2	0.27	0.050		26-JUN-96	38435	L7312-34
SULFATE	mg/L	375.4	250	50.	D(1:10)	03-JUL-96	38436	L7312-41

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: B8-D2	Date Collected: 24-JUN-96
Matrix: Water	Date Received: 25-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	2700	20.		27-JUN-96	38472	L7312-42
Alkalinity, total (as CaCO3)	mg/L	310.1	330	10.		28-JUN-96	38432	L7312-42
Chloride	mg/L	325.2	1000	100	D(1:100)	01-JUL-96	38433	L7312-42
Nitrate-Nitrite-Nitrogen	mg/L	353.2	0.15	0.050		26-JUN-96	38435	L7312-35
SULFATE	mg/L	375.4	120	25.	D(1:5)	03-JUL-96	38436	L7312-42

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: B5-R08	Date Collected: 24-JUN-96
Matrix: Water	Date Received: 25-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Total Dissolved Solids	mg/L	160.1	7200	20.		27-JUN-96	38472	L7312-43
Alkalinity, total (as CaCO3)	mg/L	310.1	440	10.		28-JUN-96	38432	L7312-43
Chloride	mg/L	325.2	4000	100	D(1:100)	01-JUL-96	38433	L7312-43
Nitrate-Nitrite-Nitrogen	mg/L	353.2	4.8	0.050		26-JUN-96	38435	L7312-37
SULFATE	mg/L	375.4	480	100	D(1:20)	03-JUL-96	38436	L7312-43

CALIBRATION AND QC SUMMARY SHEETS

LOCKHEED ANALYTICAL LABORATORIES

WATER QUALITY PARAMETERS

CALIBRATON SUMMARY

SDG: N/A	UNITS: mg/L
LAL BATCH: 624-DMX ~~619-TDS~~ AS 7-2-96	Date weights calibrated: 2/09/96
METHOD: 160.1	
ANALYTE: Total Dissolved Solids	Balance ID: 23548
Manufacturer: Troemner	Lot #: 2512

ANALYTICAL BALANCE DATA

WEIGHT TYPE (Grams)	BALANCE CRITERIA (Upper Limit)	BALANCE CRITERIA (Lower Limit)	BALANCE RESPONSE (Grams)	DATE BALANCE CALIBRATION	LOG BOOK NUMBER
50.0 g	50.0050	49.9950	49.9988	7-2-96	0245
5.0 g	5.0010	4.9900	4.9999	"	0245
0.5 g	0.5010	0.4990	0.5000	"	0245

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
QUALITY CONTROL DATA SUMMARY

SDG: N/A	ANALYTE: Total Dissolved Solids
LAL BATCH: 624-Dm x	UNITS: mg/L

LABORATORY CONTROL SAMPLES

LCS ID	ACCEPTANCE LIMITS (%R)	TRUE VALUE	FOUND VALUE	% RECOVERY
TDS LCS	100(+/-)15	1000	1008	100.8%
TDS LCSD	100(+/-)15	1000	—	—

LABORATORY DUPLICATE SAMPLES

CLIENT SAMPLE ID	ACCEPTANCE LIMITS	SAMPLE VALUE	DUPLICATE	RPD
TDS LCS/TDS LCSD	10	—	—	
B4-61	10	3120	2890	7.65

MATRIX BLANK SAMPLES

LAL SAMPLE ID	ANALYSIS RESULTS
PB	104

LOCKHEED ANALYTICAL LABORATORIES

WATER QUALITY PARAMETERS

CALIBRATON SUMMARY

SDG: N/A	UNITS: mg/L
LAL BATCH: 625-DM	Date weights calibrated: 2/09/96
METHOD: 160.1	
ANALYTE: Total Dissolved Solids	Balance ID: 23548
Manufacturer: Troemner	Lot #: 2512

ANALYTICAL BÁLANCE DATA

WEIGHT TYPE (Grams)	BALANCE CRITERIA (Upper Limit)	BALANCE CRITERIA (Lower Limit)	BALANCE RESPONSE (Grams)	DATE BALANCE CALIBRATION	LOG BOOK NUMBER
50.0 g	50.0060	49.9950			0245
5.0 g	5.0010	4.9900			0245
0.5 g	0.5010	0.4990			0245

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
QUALITY CONTROL DATA SUMMARY

SDG: N/A	ANALYTE: Total Dissolved Solids
LAL BATCH: 625-DM	UNITS: mg/L

LABORATORY CONTROL SAMPLES

-- LCS ID	ACCEPTANCE LIMITS (%R)	TRUE VALUE	FOUND VALUE	% RECOVERY
TDS LCS	100(+/-)15	1000	1020	102%
TDS LCSD	100(+/-)15	1000	—	—

LABORATORY DUPLICATE SAMPLES

CLIENT SAMPLE ID	ACCEPTANCE LIMITS	SAMPLE VALUE	DUPLICATE	RPD
TDS LCS/TDS LCSD	10	—	—	—
	10	~~1820~~ 1980	~~7220~~ 1820	~~1.19~~ 8.4

RL 6-28-

Km 7-1-96

MATRIX BLANK SAMPLES

LAL SAMPLE ID	ANALYSIS RESULTS
PB	10U

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
CALIBRATION SUMMARY

SDG: NA	UNITS: mg/L	CONSTANT: NA
LAL BATCH #: 624-DM	CALIBRATION DATE: 6/28/96	LINEAR COEFFICIENT: NA
METHOD: 310.1	CALIBRATION TIME: NA	QUADRATIC COEFFICIENT: NA
ANALYTE: CaCO3	NUMBER OF STANDARDS: 1	CUBIC COEFFICIENT: NA
INSTRUMENT: 960 ORION	CALIBRATION TYPE: LINEAR	COEFFICIENT OF DETERMINATION: NA

STANDARD DATA

STANDARD ID	MANUFACTURER	LOT #	TRUE VALUE (M)	INSTRUMENT RESPONSE	CALCULATED CONCENTRATION
ANE	MALLINCKRODT	7527KECR	0.025	NA	0.025 M

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND	% RECOVERY
ICV	5001.006 mg/L	4953.655 mg/L	99.05

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND
ICB	NA	10U

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND	% RECOVERY
CCV	5001.006 mg/L	5078.596 mg/L	101.55

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND
CCB	NA	10U

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
QUALITY CONTROL DATA SUMMARY

SDG: NA	ANALYTE: CaCO3
LAL BATCH #: 624-DM	UNITS: mg/L

LABORATORY CONTROL SAMPLES

LCS ID	ACCEPTANCE LIMITS (%R)	ANALYTE	TRUE VALUE mg/L	FOUND VALUE mg/L	% RECOVERY
LCS	80-120	TOTAL ALKA.	5001.006 mg/L	4929.785 mg/L	98.58 %

MATRIX SPIKE SAMPLES

CLIENT SAMPLE ID	ACCEPTANCE LIMITS (%R)	SPIKED SAMPLE RESULTS	SAMPLE RESULTS	SPIKE ADDED	% RECOVERY
NA					

LABORATORY DUPLICATE SAMPLES

CLIENT SAMPLE ID	ACCEPTANCE LIMITS (RPD)	SAMPLE VALUE	DUPLICATE VALUE	% RPD
C6-R04	20	517.445 mg/L	514.051 mg/L	0.7

FIELD DUPLICATE SAMPLES

CLIENT SAMPLE ID	CLIENT DUPLICATE SAMPLE ID	SAMPLE VALUE	DUPLICATE VALUE	% RPD

FIELD BLANK SAMPLES

CLIENT SAMPLE ID	ANALYSIS RESULTS
NA	

EXTRACTION BLANK

LAL SAMPLE ID	ANALYSIS RESULTS
NA	

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
CALIBRATION SUMMARY

SDG: NA	UNITS: mg/L	CONSTANT: NA
LAL BATCH #: 624-DM	CALIBRATION DATE: 7/1/96	LINEAR COEFFICIENT: NA
METHOD: 310.1	CALIBRATION TIME: NA	QUADRATIC COEFFICIENT: NA
ANALYTE: CaCO3	NUMBER OF STANDARDS: 1	CUBIC COEFFICIENT: NA
INSTRUMENT: 960 ORION	CALIBRATION TYPE: LINEAR	COEFFICIENT OF DETERMINATION: NA

STANDARD DATA

STANDARD ID	MANUFACTURER	LOT #	TRUE VALUE (M)	INSTRUMENT RESPONSE	CALCULATED CONCENTRATION
ANE	MALLINCKRODT	7527KECR	0.025	NA	0.025 M

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND	% RECOVERY
ICV	5001.006 mg/L	4995.373 mg/L	99.89

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND
ICB	NA	10U

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND	% RECOVERY
CCV	5001.006 mg/L	5067.003 mg/L	101.32

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND
CCB	NA	10U

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
QUALITY CONTROL DATA SUMMARY

SDG: NA	ANALYTE: CaCO3
LAL BATCH #: 624-DM	UNITS: mg/L

LABORATORY CONTROL SAMPLES

LCS ID	ACCEPTANCE LIMITS (%R)	ANALYTE	TRUE VALUE mg/L	FOUND VALUE mg/L	% RECOVERY
LCS	80-120	TOTAL ALKA.	5001.006 mg/L	4993.498 mg/L	99.85 %

MATRIX SPIKE SAMPLES

CLIENT SAMPLE ID	ACCEPTANCE LIMITS (%R)	SPIKED SAMPLE RESULTS	SAMPLE RESULTS	SPIKE ADDED	% RECOVERY
NA					

LABORATORY DUPLICATE SAMPLES

CLIENT SAMPLE ID	ACCEPTANCE LIMITS (RPD)	SAMPLE VALUE	DUPLICATE VALUE	% RPD
D7-34	20	8688.461 mg/L	8616.268 mg/L	0.8

FIELD DUPLICATE SAMPLES

CLIENT SAMPLE ID	CLIENT DUPLICATE SAMPLE ID	SAMPLE VALUE	DUPLICATE VALUE	% RPD

FIELD BLANK SAMPLES

CLIENT SAMPLE ID	ANALYSIS RESULTS
NA	

EXTRACTION BLANK

LAL SAMPLE ID	ANALYSIS RESULTS
NA	

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
CALIBRATION SUMMARY

SDG: NA	UNITS: mg/L	CONSTANT: NA
LAL BATCH #: 624-DMX	CALIBRATION DATE: 7/2/96	LINEAR COEFFICIENT: NA
METHOD: 310.1	CALIBRATION TIME: NA	QUADRATIC COEFFICIENT: NA
ANALYTE: CaCO3	NUMBER OF STANDARDS: 1	CUBIC COEFFICIENT: NA
INSTRUMENT: 960 ORION	CALIBRATION TYPE: LINEAR	COEFFICIENT OF DETERMINATION: NA

STANDARD DATA

STANDARD ID	MANUFACTURER	LOT #	TRUE VALUE (M)	INSTRUMENT RESPONSE	CALCULATED CONCENTRATION
ANE	MALLINCKRODT	7527KECR	0.025	NA	0.025 M

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND	% RECOVERY
ICV	5001.006 mg/L	5029.876 mg/L	100.58

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND
ICB	NA	10U

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND	% RECOVERY
CCV	5001.006 mg/L	5059.128 mg/L	101.16

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND
CCB	NA	10U

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
QUALITY CONTROL DATA SUMMARY

SDG: NA	ANALYTE: CaCO3
LAL BATCH #: 624-DMX	UNITS: mg/L

LABORATORY CONTROL SAMPLES

LCS ID	ACCEPTANCE LIMITS (%R)	ANALYTE	TRUE VALUE mg/L	FOUND VALUE mg/L	% RECOVERY
LCS	80-120	TOTAL ALKA.	5001.006 mg/L	4978.872 mg/L	99.56 %

MATRIX SPIKE SAMPLES

CLIENT SAMPLE ID	ACCEPTANCE LIMITS (%R)	SPIKED SAMPLE RESULTS	SAMPLE RESULTS	SPIKE ADDED	% RECOVERY
NA					

LABORATORY DUPLICATE SAMPLES

CLIENT SAMPLE ID	ACCEPTANCE LIMITS (RPD)	SAMPLE VALUE	DUPLICATE VALUE	% RPD
B4-61	20	1082.968 mg/L	1056.341 mg/L	2.5

FIELD DUPLICATE SAMPLES

CLIENT SAMPLE ID	CLIENT DUPLICATE SAMPLE ID	SAMPLE VALUE	DUPLICATE VALUE	% RPD

FIELD BLANK SAMPLES

CLIENT SAMPLE ID	ANALYSIS RESULTS
NA	

EXTRACTION BLANK

LAL SAMPLE ID	ANALYSIS RESULTS
NA	

LOCKHEED ANALYTICAL SERVICES – FIA Initial Calibration Summary

SDG:		UNITS:	mg/L	INTERCEPT	-19.96068
LAL BATCH:	624-dm	CALIB. DATE:	07-01-1996	LINEAR COEFF	45.06367
METHOD:	325.2	WORKSHEET #:	960701B	QUADRATIC COEFF	-9.398448E
ANALYTE:	Cl	# OF STANDARDS:	7	CORRELATION COEFF	.9997951
INSTRUMENT:	FIA	CALIBRATION TYPE:	QUADRATIC		

STANDARD DATA

STANDARD ID	MANUFACTURER	LOT #	TRUE VALUE	HEIGHT
S1: 0	MALLINCKRODT	6858KDPG	0	0
S2: 1	MALLINCKRODT	6858KDPG	1	34
S3: 2	MALLINCKRODT	6858KDPG	2	58
S4: 5	MALLINCKRODT	6858KDPG	5	178
S5: 25	MALLINCKRODT	6858KDPG	25	1058
S6: 50	MALLINCKRODT	6858KDPG	50	1996
~~S7: 100~~	~~MALLINCKRODT~~	~~6858KDPG~~	~~100~~	~~0~~

AB 7/3/96

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND	% RECOVERY
ICV	10	40	39.33	98.3%
~~ICV~~	~~84~~	~~40~~	~~38.244~~	~~95.6%~~

AB 7/3/96

INITIAL CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND
ICB	11	1 u
~~ICB~~	~~85~~	~~33.387 B~~

AB 7/3/96

LOCKHEED ANALYTICAL SERVICES – FIA Continuing Calibration Summary

SDG:		UNITS:	mg/L	INTERCEPT	-19.96068
LAL BATCH:	624-dm	CALIB. DATE:	07-01-1996	LINEAR COEFF	45.06367
METHOD:	325.2	WORKSHEET #:	00:00:00	QUADRATIC COEFF	-9.398448E
ANALYTE:	Cl	# OF STANDARDS:	7	CORRELATION COEFF	.9997951
INSTRUMENT:	FIA	CALIBRATION TYPE:	QUADRATIC		

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND	% RECOVERY
CCV	14	50	48.096	96.2%
CCV	38	50	47.735	95.5%
CCV	62	50	47.652	95.3%
~~CCV~~	~~79~~	~~50~~	~~0.888~~	~~1.8%~~
~~CCV~~	~~106~~	~~50~~	~~2.542~~	~~5.1%~~
~~CCV~~	~~118~~	~~50~~	~~0.443~~	~~0.9%~~

KB 7/3/96

CONTINUING CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND	
CCB	15	1	u
CCB	39	1	u
CCB	63	1	u
~~CCB~~	~~80~~	~~1~~	~~u~~
~~CCB~~	~~107~~	~~4.547~~	~~B~~

KB 7/7/96

LOCKHEED ANALYTICAL SERVICES – FIA Initial Calibration Summary

SDG:		UNITS:	mg/L	INTERCEPT	-18.10177
LAL BATCH:	624-dm	CALIB. DATE:	07-02-1998	LINEAR COEFF	22.8126
METHOD:	325.2	WORKSHEET #:	960702A	QUADRATIC COEFF	-3.443512E
ANALYTE:	Cl	# OF STANDARDS:	7	CORRELATION COEFF	.9998199
INSTRUMENT:	FIA	CALIBRATION TYPE:	QUADRATIC		

STANDARD DATA

STANDARD ID	MANUFACTURER	LOT #	TRUE VALUE	HEIGHT
S1: 0	MALLINCKRODT	6858KDPG	0	0
S2: 1	MALLINCKRODT	6858KDPG	1	11
S3: 2	MALLINCKRODT	6858KDPG	2	22
S4: 5	MALLINCKRODT	6858KDPG	5	80
S5: 25	MALLINCKRODT	6858KDPG	25	514
S6: 50	MALLINCKRODT	6858KDPG	50	1052
S7: 100	MALLINCKRODT	6858KDPG	100	1916

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND	% RECOVERY
ICV	10	40	40.984	102.5%

INITIAL CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND
ICB	11	1 u

LOCKHEED ANALYTICAL SERVICES – FIA Continuing Calibration Summary

SDG:		UNITS:	mg/L	INTERCEPT	-18.10177
LAL BATCH:	624-dm	CALIB. DATE:	07-02-1996	LINEAR COEFF	22.8126
METHOD:	325.2	WORKSHEET #:	00:00:00	QUADRATIC COEFF	-3.443512E
ANALYTE:	Cl	# OF STANDARDS:	7	CORRELATION COEFF	.9998199
INSTRUMENT:	FIA	CALIBRATION TYPE:	QUADRATIC		

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND	% RECOVERY
CCV	14	50	46.488	93.0%
CCV	38	50	46.795	93.6%
~~CCV~~	~~62~~	~~50~~	~~36.782~~	~~73.5%~~
~~CCV~~	~~70~~	~~50~~	~~0.794~~	~~1.6%~~

KB 7/3/96

CONTINUING CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND
CCB	15	1 u
CCB	39	1 u
~~CCB~~	~~63~~	~~1 u~~
~~CCB~~	~~71~~	~~1 u~~

KB 7/3/96

LOCKHEED ANALYTICAL LABORATORY
QUALITY CONTROL DATA SUMMARY
LCS AND MATRIX BLANK ANALYSES

SDG: Worksheet: 960702A

Batch ID: 624-dm

LABORATORY CONTROL SAMPLES

LCS ID	ANALYTE	ACCEPTANCE LIMITS (%R)	TRUE VALUE	FOUND VALUE	% RECOVERY	FLAG	UNITS
LCS	Cl	80-120	10	10.2	102.0%		mg/L

MATRIX BLANK SAMPLES

LAL SAMPLE ID	ANALYTE	RESULT	FLAG	UNITS
PB	Cl	< 1	U	mg/L

Km 7-3-96

LOCKHEED ANALYTICAL LABORATORY
QUALITY CONTROL DATA SUMMARY
SPIKE AND DUPLICATE SAMPLES

SDG: Worksheet: 960702A

Batch ID: 624-dm

MATRIX SPIKE SAMPLES

SAMPLE ID	ACCEPTANCE LIMITS (%R)	ANALYTE	SPIKED SAMPLE RESULT	SAMPLE RESULT	SPIKE ADDED	% RECOVERY	FLAG	UNITS
L7305-161S	75 - 125	Cl	3420.916	3391.6	10	a		mg/L

LABORATORY DUPLICATE SAMPLES

SAMPLE ID	ACCEPTANCE LIMITS (%R)	ANALYTE	SAMPLE RESULT	DUPLICATE RESULT	RPD	FLAG	UNITS
L7305-161D	85 - 115	Cl	3391.6	3411.141	0.6%		mg/L

LOCKHEED ANALYTICAL SERVICES – FIA Initial Calibration Summary

SDG:		UNITS:	mg/L	INTERCEPT	-19.96068
LAL BATCH:	624-DMX	CALIB. DATE:	07-01-1996	LINEAR COEFF	45.06367
METHOD:	325.2	WORKSHEET #:	960701B	QUADRATIC COEFF	-9.398448E
ANALYTE:	Cl	# OF STANDARDS:	7	CORRELATION COEFF	.9997951
INSTRUMENT:	FIA	CALIBRATION TYPE:	QUADRATIC		

STANDARD DATA

STANDARD ID	MANUFACTURER	LOT #	TRUE VALUE	HEIGHT
S1: 0	MALLINCKRODT	6858KDPG	0	0
S2: 1	MALLINCKRODT	6858KDPG	1	34
S3: 2	MALLINCKRODT	6858KDPG	2	58
S4: 5	MALLINCKRODT	6858KDPG	5	178
S5: 25	MALLINCKRODT	6858KDPG	25	1058
S6: 50	MALLINCKRODT	6858KDPG	50	1996
~~S7: 100~~	~~MALLINCKRODT~~	~~6858KDPG~~	~~100~~	~~0~~

AD 7/1/96 Overrange

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND	% RECOVERY
ICV	10	40	39.33	98.3%
~~ICV~~	~~84~~	~~40~~	~~38.244~~	~~95.6%~~

AD 7/2/96

INITIAL CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND	
ICB	11	1	u
~~ICB~~	~~85~~	~~35.387~~	~~B~~

AD 7/2/96

LOCKHEED ANALYTICAL SERVICES – FIA Continuing Calibration Summary

SDG:		UNITS:	mg/L	INTERCEPT	-19.96068
LAL BATCH:	624-DMX	CALIB. DATE:	07-01-1996	LINEAR COEFF	45.06367
METHOD:	325.2	WORKSHEET #:	00:00:00	QUADRATIC COEFF	-9.398448E
ANALYTE:	Cl	# OF STANDARDS:	7	CORRELATION COEFF	.9997951
INSTRUMENT:	FIA	CALIBRATION TYPE:	QUADRATIC		

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND	% RECOVERY
CCV	14	50	48.096	96.2%
CCV	38	50	47.735	95.5%
CCV	62	50	47.652	95.3%
~~CCV~~	~~79~~	~~50~~	~~0.888~~	~~1.8%~~
~~CCV~~	~~106~~	~~50~~	~~2.542~~	~~5.1%~~
~~CCV~~	~~116~~	~~50~~	~~0.449~~	~~0.9%~~

7/1/96

CONTINUING CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND
CCB	15	1 u
CCB	39	1 u
~~CCB~~	~~63~~	~~1 u~~
~~CCB~~	~~80~~	~~1 u~~
~~CCB~~	~~107~~	~~4.547 B~~

CCB 63 1U OK 7/2/96

7/1/96

LOCKHEED ANALYTICAL LABORATORY
QUALITY CONTROL DATA SUMMARY
LCS AND MATRIX BLANK ANALYSES

SDG: Worksheet: 960701B

Batch ID: 624-DMX

LABORATORY CONTROL SAMPLES

LCS ID	ANALYTE	ACCEPTANCE LIMITS (%R)	TRUE VALUE	FOUND VALUE	% RECOVERY	FLAG	UNITS
LCS	Cl	80 - 120	10	9.231	92.3%		mg/L

MATRIX BLANK SAMPLES

LAL SAMPLE ID	ANALYTE	RESULT	FLAG	UNITS
PB	Cl	U		mg/L

LOCKHEED ANALYTICAL LABORATORY
QUALITY CONTROL DATA SUMMARY
SPIKE AND DUPLICATE SAMPLES

SDG: Worksheet: 960701B

Batch ID: 624-DMX

MATRIX SPIKE SAMPLES

SAMPLE ID	ACCEPTANCE LIMITS (%R)	ANALYTE	SPIKED SAMPLE RESULT	SAMPLE RESULT	SPIKE ADDED	% RECOVERY		FLAG	UNITS
L7305-102S	75 - 125	Cl	1190.028	1325.862	10	a	*		mg/L

0

LABORATORY DUPLICATE SAMPLES

SAMPLE ID	ACCEPTANCE LIMITS (%R)	ANALYTE	SAMPLE RESULT	DUPLICATE RESULT	RPD	FLAG	UNITS
L7305-102D	0 - 15	Cl	1325.862	1173.689	12.2%		mg/L

LOCKHEED ANALYTICAL SERVICES – FIA Initial Calibration Summary

SDG:		UNITS:	mg/L	INTERCEPT	-1.08341
LAL BATCH:	625-dm	CALIB. DATE:	06-26-1996	LINEAR COEFF	403.0304
METHOD:	353.2	WORKSHEET #:	960626A	QUADRATIC COEFF	.7668846
ANALYTE:	NO2+N03-N	# OF STANDARDS:	7	CORRELATION COEFF	.9999974
INSTRUMENT:	FIA	CALIBRATION TYPE:	QUADRATIC		

STANDARD DATA

STANDARD ID	MANUFACTURER	LOT #	TRUE VALUE	HEIGHT
S1: 0	EM SCIENCE	30342105	0	0
S2: .05	EM SCIENCE	30342105	0.05	17
S3: .2	EM SCIENCE	30342105	0.2	81
S4: 1	EM SCIENCE	30342105	1	405
S5: 2	EM SCIENCE	30342105	2	803
S6: 4	EM SCIENCE	30342105	4	1626
S7: 8.01	EM SCIENCE	30342105	8.01	3276

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND	% RECOVERY
ICV	11	3	2.99	99.7%

INITIAL CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND
ICB	12	0.02 u

LOCKHEED ANALYTICAL SERVICES – FIA Continuing Calibration Summary

SDG:		UNITS:	mg/L	INTERCEPT	-1.08341
LAL BATCH:	625-dm	CALIB. DATE:	06-26-1996	LINEAR COEFF	403.0304
METHOD:	353.2	WORKSHEET #:	00:00:00	QUADRATIC COEFF	.7668846
ANALYTE:	NO2+N03-N	# OF STANDARDS:	7	CORRELATION COEFF	.9999974
INSTRUMENT:	FIA	CALIBRATION TYPE:	QUADRATIC		

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND	% RECOVERY
CCV	14	4	3.985	99.6%
CCV	38	4	3.909	97.7%
CCV	56	4	3.831	95.8%
CCV	69	4	3.835	95.9%
~~CCV~~	~~77~~	~~4~~	~~1.544~~	~~38.6%~~

6/27/96

CONTINUING CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND
CCB	15	0.02 u
CCB	39	0.02 u
CCB	57	0.02 u
CCB	70	0.02 u
~~CCB~~	~~78~~	~~0.02 u~~

6/27/96

LOCKHEED ANALYTICAL LABORATORY
QUALITY CONTROL DATA SUMMARY
LCS AND MATRIX BLANK ANALYSES

SDG: Worksheet: 960626A

Batch ID: 625-dm

LABORATORY CONTROL SAMPLES

LCS ID	ANALYTE	ACCEPTANCE LIMITS (%R)	TRUE VALUE	FOUND VALUE	% RECOVERY	FLAG	UNITS
NO3	NO2+N03-N	80-120	4	3.909	97.7%		mg/L
LCS	NO2+N03-N	80-120	5	5.055	101.1%		mg/L

MATRIX BLANK SAMPLES

LAL SAMPLE ID	ANALYTE	RESULT	FLAG	UNITS
PB	NO2+N03-N	0.02	B	mg/L

LOCKHEED ANALYTICAL LABORATORY
QUALITY CONTROL DATA SUMMARY
SPIKE AND DUPLICATE SAMPLES

SDG: Worksheet: 960626A

Batch ID: 625-dm

MATRIX SPIKE SAMPLES

SAMPLE ID	ACCEPTANCE LIMITS (%R)	ANALYTE	SPIKED SAMPLE RESULT	SAMPLE RESULT	SPIKE ADDED	% RECOVERY	FLAG	UNITS
L7312-33S	75 - 125	NO2+N03-N	5.143	0.142	5	100.0%		mg/L

LABORATORY DUPLICATE SAMPLES

SAMPLE ID	ACCEPTANCE LIMITS (%R)	ANALYTE	SAMPLE RESULT	DUPLICATE RESULT	RPD	FLAG	UNITS
L7312-33D	85 - 115	NO2+N03-N	0.142	0.137	3.6%		mg/L

km 6.28.96

LOCKHEED ANALYTICAL SERVICES – FIA Initial Calibration Summary

SDG:		UNITS:	mg/L	INTERCEPT	-8.743919
LAL BATCH:	607-mk	CALIB. DATE:	06-26-1996	LINEAR COEFF	421.626
METHOD:	353.2	WORKSHEET #:	960626B	QUADRATIC COEFF	1.563267
ANALYTE:	NO2+N03-N	# OF STANDARDS:	7	CORRELATION COEFF	.9999932
INSTRUMENT:	FIA	CALIBRATION TYPE:	QUADRATIC		

STANDARD DATA

STANDARD ID	MANUFACTURER	LOT #	TRUE VALUE	HEIGHT
S1: 0	EM SCIENCE	30342105	0	0
S2: .05	EM SCIENCE	30342105	0.05	9
S3: .2	EM SCIENCE	30342105	0.2	73
S4: 1	EM SCIENCE	30342105	1	412
S5: 2	EM SCIENCE	30342105	2	837
S6: 4	EM SCIENCE	30342105	4	1707
S7: 8.01	EM SCIENCE	30342105	8.01	3468

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND	% RECOVERY
ICV	11	3	3.06	102.0%

INITIAL CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND	
ICB	12	0.033	B

LOCKHEED ANALYTICAL SERVICES – FIA Continuing Calibration Summary

SDG:		UNITS:	mg/L	INTERCEPT	-8.743919
LAL BATCH:	607-mk	CALIB. DATE:	06-26-1996	LINEAR COEFF	421.626
METHOD:	353.2	WORKSHEET #:	00:00:00	QUADRATIC COEFF	1.563267
ANALYTE:	NO2+N03-N	# OF STANDARDS:	7	CORRELATION COEFF	.9999932
INSTRUMENT:	FIA	CALIBRATION TYPE:	QUADRATIC		

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND	% RECOVERY
CCV	14	4	3.977	99.4%
CCV	21	4	4.017	100.4%

CONTINUING CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND
CCB	15	0.03 B
CCB	22	~~7.954 B~~ 0.021 B 6/27/96

LOCKHEED ANALYTICAL LABORATORY
QUALITY CONTROL DATA SUMMARY
LCS AND MATRIX BLANK ANALYSES

SDG: Worksheet: 960626B

Batch ID: 625-dm

LABORATORY CONTROL SAMPLES

LCS ID	ANALYTE	ACCEPTANCE LIMITS (%R)	TRUE VALUE	FOUND VALUE	% RECOVERY	FLAG	UNITS
NO3	NO2+N03-N	80-120	4	3.908	97.7%		mg/L
LCS	NO2+N03-N	80-120	5	5.145	102.9%		mg/L

MATRIX BLANK SAMPLES

LAL SAMPLE ID	ANALYTE	RESULT	FLAG	UNITS
PB	NO2+N03-N	0.021	B	mg/L

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
CALIBRATION SUMMARY

SDG: N/A	UNITS: mg/L	CONSTANT: -1.91775
LAL BATCH: 624-dm	CALIBRATION DATE: 7/3/96	LINEAR COEFFICIENT: 3.80345
METHOD: 375.4	CALIBRATION TIME: 4:30 p.m.	QUADRATIC COEFFICIENT: N/A
ANALYTE: Sulfate	NUMBER OF STANDARDS: 5	CUBIC COEFFICIENT: N/A
INSTRUMENT: HF DRT 100B	CALIBRATION TYPE: Linear	COEFFICIENT OF DETERMINATION (r^2): 0.9990555

STANDARD DATA

STANDARD ID	MANUFACTURER	LOT #	TRUE VALUE	INSTRUMENT RESPONSE (NTU)	CALCULATED CONCENTRATION
1	Mallinckrodt	8024 KEMC	0.0	0.87	0.73
2	"	"	5.0	15.5	4.58
3	"	"	10.0	34.5	9.57
4	"	"	20.0	73.8	19.9
5	"	"	40.0	151	40.2

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND	% RECOVERY
ICV	20.0	19.17	95.9

INITIAL CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND
ICB	N/A	1.00 U

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND VALUE	% RECOVERY
CCV1	N/A	20.0	19.20	96.0
CCV2	N/A	20.0	19.57	97.9
CCV3	N/A	20.0	20.28	101.4

CONTINUING CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND
CCB1	N/A	1.00 U
CCB2	N/A	1.00 U
CCB3	N/A	1.16 B

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
QUALITY CONTROL DATA SUMMARY

SDG: N/A	ANALYTE: Turbidimetric Sulfate
LAL BATCH: 624-dm	UNITS: mg/L

LABORATORY CONTROL SAMPLES

LCS ID	ACCEPTANCE LIMITS (%R)	TRUE VALUE	FOUND VALUE	% RECOVERY
lcs624dm	80-120	10.0	9.29	92.9

MATRIX SPIKE SAMPLES

CLIENT SAMPLE ID	ACCEPTANCE LIMITS (%R)	SPIKED SAMPLE RESULT	SAMPLE RESULT	SPIKE ADDED	% RECOVERY
C6-R04	75-125	320.55	221.69	10.0(x10)	98.9

LABORATORY DUPLICATE SAMPLES

CLIENT SAMPLE ID	ACCEPTANCE LIMITS (RPD)	SAMPLE VALUE	DUPLICATE VALUE	% RPD
C6-R04	20	221.69	227.73	2.7

FIELD DUPLICATE SAMPLES

CLIENT SAMPLE ID	CLIENT DUPLICATE SAMPLE ID	SAMPLE VALUE	DUPLICATE VALUE	RPD
N/A				

FIELD BLANK SAMPLES

CLIENT SAMPLE ID	ANALYSIS RESULT
N/A	

MATRIX BLANK SAMPLES

LAL SAMPLE ID	ANALYSIS RESULT
pb624dm	1.00 U

LOCKHEED ANALYTICAL LABORATORY
WATER QUALITY PARAMETERS
CALIBRATION SUMMARY

SDG: N/A	UNITS: mg/L	CONSTANT: -1.91775
LAL BATCH: 624-dmX	CALIBRATION DATE: 7/3/96	LINEAR COEFFICIENT: 3.80345
METHOD: 375.4	CALIBRATION TIME: 4:30 p.m.	QUADRATIC COEFFICIENT: N/A
ANALYTE: Sulfate	NUMBER OF STANDARDS: 5	CUBIC COEFFICIENT: N/A
INSTRUMENT: HF DRT 1008	CALIBRATION TYPE: Linear	COEFFICIENT OF DETERMINATION (r^2): 0.9990555

STANDARD DATA

STANDARD ID	MANUFACTURER	LOT #	TRUE VALUE	INSTRUMENT RESPONSE (NTU)	CALCULATED CONCENTRATION
1	Mallinckrodt	8024 KEMC	0.0	0.87	0.73
2	"	"	5.0	15.5	4.58
3	"	"	10.0	34.5	9.57
4	"	"	20.0	73.8	19.9
5	"	"	40.0	151	40.2

INITIAL CALIBRATION VERIFICATION DATA

SAMPLE ID	TRUE VALUE	FOUND	% RECOVERY
ICV	20.0	19.17	95.9

INITIAL CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND
ICB	N/A	1.00 U

CONTINUING CALIBRATION VERIFICATION DATA

SAMPLE ID	INJECTION #	TRUE VALUE	FOUND VALUE	% RECOVERY
CCV1	N/A	20.0	19.20	96.0
CCV2	N/A	20.0	19.57	97.9
CCV3	N/A	20.0	20.28	101.4

CONTINUING CALIBRATION BLANK DATA

SAMPLE ID	INJECTION #	FOUND
CCB1	N/A	1.00 U
CCB2	N/A	1.00 U
CCB3	N/A	1.16 B

METALS RESULTS

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: C3-65	Date Collected: 24-JUN-96
Matrix: Water	Date Received: 25-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CADMIUM, TOTAL	mg/l	6010	< 0.0030	0.0030	0.0050	U	1	03-JUL-96	38510	L7312-38
CHROMIUM, TOTAL	mg/l	6010	< 0.0060	0.0060	0.010	U	1	03-JUL-96	38510	L7312-38
NICKEL, TOTAL	mg/l	6010	< 0.012	0.012	0.040	U	1	03-JUL-96	38510	L7312-38
VANADIUM, TOTAL	mg/l	6010	< 0.0060	0.0060	0.050	U	1	03-JUL-96	38510	L7312-38
ARSENIC, TOTAL	mg/l	7060	0.0043	0.0020	0.010	B	1	01-JUL-96	38511	L7312-38
LEAD, TOTAL	mg/l	7421	< 0.0020	0.0020	0.0030	U	1	01-JUL-96	38511	L7312-38
MERCURY, TOTAL	mg/L	7470	< 0.00020	0.00020	0.00020	U	1	01-JUL-96	38512	L7312-38

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: B8-D2	Date Collected: 24-JUN-96
Matrix: Water	Date Received: 25-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CADMIUM, TOTAL	mg/l	6010	< 0.0030	0.0030	0.0050	U	1	03-JUL-96	38510	L7312-39
CHROMIUM, TOTAL	mg/l	6010	< 0.0060	0.0060	0.010	U	1	03-JUL-96	38510	L7312-39
NICKEL, TOTAL	mg/l	6010	< 0.012	0.012	0.040	U	1	03-JUL-96	38510	L7312-39
VANADIUM, TOTAL	mg/l	6010	< 0.0060	0.0060	0.050	U	1	03-JUL-96	38510	L7312-39
ARSENIC, TOTAL	mg/l	7060	< 0.0020	0.0020	0.010	U	1	01-JUL-96	38511	L7312-39
LEAD, TOTAL	mg/l	7421	< 0.0020	0.0020	0.0030	U	1	01-JUL-96	38511	L7312-39
MERCURY, TOTAL	mg/L	7470	< 0.00020	0.00020	0.00020	U	1	01-JUL-96	38512	L7312-39

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: B5-R08	Date Collected: 24-JUN-96
Matrix: Water	Date Received: 25-JUN-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CADMIUM, TOTAL	mg/l	6010	< 0.0030	0.0030	0.0050	U	1	03-JUL-96	38510	L7312-40
CHROMIUM, TOTAL	mg/l	6010	< 0.0060	0.0060	0.010	U	1	03-JUL-96	38510	L7312-40
NICKEL, TOTAL	mg/l	6010	< 0.012	0.012	0.040	U	1	03-JUL-96	38510	L7312-40
VANADIUM, TOTAL	mg/l	6010	< 0.0060	0.0060	0.050	U	1	03-JUL-96	38510	L7312-40
ARSENIC, TOTAL	mg/l	7060	< 0.0020	0.0020	0.010	U	1	01-JUL-96	38511	L7312-40
LEAD, TOTAL	mg/l	7421	< 0.0020	0.0020	0.0030	U	1	01-JUL-96	38511	L7312-40
MERCURY, TOTAL	mg/L	7470	0.00033	0.00020	0.00020		1	01-JUL-96	38512	L7312-40

LOCKHEED ANALYTICAL SERVICES

METALS RESULTS

QC Data Summary For Reagent Blank Analysis

Constituent	Units	MDL	RDL	LAS Batch ID	Date Analyzed	Reagent Blank Result	Data Qualifier
CADMIUM, TOTAL	mg/l	.003	.005	38510	03-JUL-96	< .003	
CHROMIUM, TOTAL	mg/l	.006	.01	38510	03-JUL-96	< .006	
NICKEL, TOTAL	mg/l	.012	.04	38510	03-JUL-96	< .012	
VANADIUM, TOTAL	mg/l	.006	.05	38510	03-JUL-96	< .006	

LOCKHEED ANALYTICAL SERVICES

METALS RESULTS

QC Data Summary For Reagent Blank Analysis

Constituent	Units	MDL	RDL	LAS Batch ID	Date Analyzed	Reagent Blank Result	Data Qualifier
ARSENIC, TOTAL	mg/l	.002	.01	38511	01-JUL-96	< .002	
LEAD, TOTAL	mg/l	.002	.003	38511	01-JUL-96	< .002	

LOCKHEED ANALYTICAL SERVICES

METALS RESULTS

QC Data Summary For Reagent Blank Analysis

Constituent	Units	MDL	RDL	LAS Batch ID	Date Analyzed	Reagent Blank Result	Data Qualifier
MERCURY, TOTAL	mg/L	.0002	.0002	38512	01-JUL-96	< .0002	

LOCKHEED ANALYTICAL SERVICES

METALS RESULTS

QC Data Summary For Duplicate Sample Analysis

Client Sample ID C3-65 (DUP)

Constituent	Units	LAS Batch ID	LAS Sample ID	Date Analyzed	Sample Result	Duplicate Result	Relative Percent Difference	Control Limit	Data Qualifier
CADMIUM, TOTAL	mg/l	38510	L7312-38	03-JUL-96	< 0.0030	< 0.0030	b		
CHROMIUM, TOTAL	mg/l	38510	L7312-38	03-JUL-96	< 0.0060	< 0.0060	b		
NICKEL, TOTAL	mg/l	38510	L7312-38	03-JUL-96	< 0.012	< 0.012	b		
VANADIUM, TOTAL	mg/l	38510	L7312-38	03-JUL-96	< 0.0060	< 0.0060	b		
ARSENIC, TOTAL	mg/l	38511	L7312-38	01-JUL-96	0.004300	0.003400		0.010	
LEAD, TOTAL	mg/l	38511	L7312-38	01-JUL-96	< 0.0020	< 0.0020	b		
MERCURY, TOTAL	mg/L	38512	L7312-38	01-JUL-96	< 0.00020	< 0.00020	b		

LOCKHEED ANALYTICAL SERVICES

METALS RESULTS

QC Data Summary For Matrix Spike Sample Analysis

Client Sample ID C3-65 (MS)

Constituent	Units	LAS Batch ID	LAS Sample ID	Date Analyzed	Matrix Spike Result	Sample Result	Spike Added	(%) Recovery	Data Qualifier
CADMIUM, TOTAL	mg/l	38510	L7312-38	03-JUL-96	0.05301	< 0.0030	0.05000	106	
CHROMIUM, TOTAL	mg/l	38510	L7312-38	03-JUL-96	0.1920	< 0.0060	0.2000	96	
NICKEL, TOTAL	mg/l	38510	L7312-38	03-JUL-96	0.4632	< 0.012	0.5000	93	
VANADIUM, TOTAL	mg/l	38510	L7312-38	03-JUL-96	0.5033	< 0.0060	0.5000	101	
ARSENIC, TOTAL	mg/l	38511	L7312-38	01-JUL-96	0.5040	0.004300	0.5000	100	
LEAD, TOTAL	mg/l	38511	L7312-38	01-JUL-96	0.5000	< 0.0020	0.5000	100	
MERCURY, TOTAL	mg/L	38512	L7312-38	01-JUL-96	0.001243	< 0.00020	0.001000	124	

LOCKHEED ANALYTICAL SERVICES

METALS RESULTS

QC Data Summary For Laboratory Control Sample Analysis

Sample: 38510LCS

Constituent	Units	LAS Batch ID	Date Analyzed	LCS True Value	LCS Result	(%) Recovery
CADMIUM, TOTAL	mg/l	38510	03-JUL-96	0.05000	0.05534	110.7
CHROMIUM, TOTAL	mg/l	38510	03-JUL-96	0.2000	0.2056	102.8
NICKEL, TOTAL	mg/l	38510	03-JUL-96	0.5000	0.5097	101.9
VANADIUM, TOTAL	mg/l	38510	03-JUL-96	0.5000	0.5106	102.1

LOCKHEED ANALYTICAL SERVICES

METALS RESULTS

QC Data Summary For Laboratory Control Sample Analysis

Sample: 38511LCS

Constituent	Units	LAS Batch ID	Date Analyzed	LCS True Value	LCS Result	(%) Recovery
ARSENIC, TOTAL	mg/l	38511	01-JUL-96	0.5000	0.5070	101.4
LEAD, TOTAL	mg/l	38511	01-JUL-96	0.5000	0.5070	101.4

LOCKHEED ANALYTICAL SERVICES

METALS RESULTS

QC Data Summary For Laboratory Control Sample Analysis

Sample: 38512LCS

Constituent	Units	LAS Batch ID	Date Analyzed	LCS True Value	LCS Result	(%) Recovery
MERCURY, TOTAL	mg/L	38512	01-JUL-96	0.001000	0.0009941	99.4

EPA METHOD 8260 (Volatile Organics)

SAMPLE RESULTS FORMS AND QC SUMMARIES

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
) VOLATILES

Client Sample ID:	C4-76	LAL Sample ID:	L7312-1
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	30-JUN-96	Analytical Dilution:	1
Matrix: --	Water	Analytical Batch ID:	063096-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	108%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	111%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	<5.0	5.0	
Vinyl Chloride	75-01-4	<5.0	5.0	
Bromomethane	74-83-9	<5.0	5.0	
Chloroethane	75-00-3	<5.0	5.0	
Trichlorofluoromethane	75-69-4	<5.0	5.0	
Acetone	67-64-1	7.9	10.	J
1,1-Dichloroethene	75-35-4	<5.0	5.0	
Carbon Disulfide	75-15-0	<5.0	5.0	
Methylene Chloride	75-09-2	<5.0	5.0	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Vinyl Acetate	108-05-4	<10.	10.	
1,1-Dichloroethane	75-34-3	2.2	5.0	J
2-Butanone	78-93-3	<10.	10.	
cis-1,2-Dichloroethene	156-59-2	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
2-Chloroethylvinylether	110-75-8	<20.	20.	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
2-Hexanone	591-78-6	<10.	10.	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Tetrachloroethene	127-18-4	<5.0	5.0	
Dibromochloromethane	124-48-1	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	1.4	5.0	J
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	2.6	5.0	J
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
) VOLATILES

Client Sample ID:	C3-65	LAL Sample ID:	L7312-4
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	30-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	063096-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	108%	84-122
Toluene-d8	109%	87-117
Bromofluorobenzene	109%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	<5.0	5.0	
Vinyl Chloride	75-01-4	<5.0	5.0	
Bromomethane	74-83-9	<5.0	5.0	
Chloroethane	75-00-3	<5.0	5.0	
Trichlorofluoromethane	75-69-4	<5.0	5.0	
Acetone	67-64-1	<10.	10.	
1,1-Dichloroethene	75-35-4	<5.0	5.0	
Carbon Disulfide	75-15-0	<5.0	5.0	
Methylene Chloride	75-09-2	<5.0	5.0	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Vinyl Acetate	108-05-4	<10.	10.	
1,1-Dichloroethane	75-34-3	<5.0	5.0	
2-Butanone	78-93-3	<10.	10.	
cis-1,2-Dichloroethene	156-59-2	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
2-Chloroethylvinylether	110-75-8	<20.	20.	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
2-Hexanone	591-78-6	<10.	10.	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Tetrachloroethene	127-18-4	<5.0	5.0	
Dibromochloromethane	124-48-1	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
8260 VOLATILES

Client Sample ID:	B8-D2	LAL Sample ID:	L7312-7
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	30-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	063096-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	108%	84-122
Toluene-d8	109%	87-117
Bromofluorobenzene	108%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DAT QUALIFI
Chloromethane	74-87-3	<5.0	5.0	
Vinyl Chloride	75-01-4	<5.0	5.0	
Bromomethane	74-83-9	<5.0	5.0	
Chloroethane	75-00-3	<5.0	5.0	
Trichlorofluoromethane	75-69-4	<5.0	5.0	
Acetone	67-64-1	4.3	10.	J
1,1-Dichloroethene	75-35-4	<5.0	5.0	
Carbon Disulfide	75-15-0	<5.0	5.0	
Methylene Chloride	75-09-2	<5.0	5.0	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Vinyl Acetate	108-05-4	<10.	10.	
1,1-Dichloroethane	75-34-3	2.1	5.0	J
2-Butanone	78-93-3	<10.	10.	
cis-1,2-Dichloroethene	156-59-2	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
2-Chloroethylvinylether	110-75-8	<20.	20.	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
2-Hexanone	591-78-6	<10.	10.	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Tetrachloroethene	127-18-4	<5.0	5.0	
Dibromochloromethane	124-48-1	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	1.3	5.0	J
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	2.1	5.0	J
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
VOLATILES

Client Sample ID:	TBS-004	LAL Sample ID:	L7312-10
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	104%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	110%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	<5.0	5.0	
Vinyl Chloride	75-01-4	<5.0	5.0	
Bromomethane	74-83-9	<5.0	5.0	
Chloroethane	75-00-3	<5.0	5.0	
Trichlorofluoromethane	75-69-4	<5.0	5.0	
Acetone	67-64-1	6.1	10.	JB
1,1-Dichloroethene	75-35-4	<5.0	5.0	
Carbon Disulfide	75-15-0	<5.0	5.0	
Methylene Chloride	75-09-2	<5.0	5.0	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Vinyl Acetate	108-05-4	<10.	10.	
1,1-Dichloroethane	75-34-3	<5.0	5.0	
2-Butanone	78-93-3	<10.	10.	
cis-1,2-Dichloroethene	156-59-2	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
2-Chloroethylvinylether	110-75-8	<20.	20.	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
2-Hexanone	591-78-6	<10.	10.	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Tetrachloroethene	127-18-4	<5.0	5.0	
Dibromochloromethane	124-48-1	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
0 VOLATILES

Client Sample ID:	EBS-001	LAL Sample ID:	L7312-13
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	28-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	100%	84-122
Toluene-d8	109%	87-117
Bromofluorobenzene	107%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Benzene	71-43-2	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
8260 VOLATILES

Client Sample ID:	B5-R08	LAL Sample ID:	L7312-16
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	30-JUN-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	063096-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	109%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	108%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	<5.0	5.0	
Vinyl Chloride	75-01-4	<5.0	5.0	
Bromomethane	74-83-9	<5.0	5.0	
Chloroethane	75-00-3	<5.0	5.0	
Trichlorofluoromethane	75-69-4	<5.0	5.0	
Acetone	67-64-1	<10.	10.	
1,1-Dichloroethene	75-35-4	<5.0	5.0	
Carbon Disulfide	75-15-0	<5.0	5.0	
Methylene Chloride	75-09-2	<5.0	5.0	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Vinyl Acetate	108-05-4	<10.	10.	
1,1-Dichloroethane	75-34-3	<5.0	5.0	
2-Butanone	78-93-3	<10.	10.	
cis-1,2-Dichloroethene	156-59-2	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
2-Chloroethylvinylether	110-75-8	<20.	20.	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
2-Hexanone	591-78-6	<10.	10.	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Tetrachloroethene	127-18-4	<5.0	5.0	
Dibromochloromethane	124-48-1	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Method Blank	LAL Sample ID:	38532MB
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	28-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	107%	84-122
Toluene-d8	111%	87-117
Bromofluorobenzene	110%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Benzene	71-43-2	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

ATILE ORGANICS BY GC/MS

Client Sample ID:	Method Blank	LAL Sample ID:	38559MB
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	108%	84-122
Toluene-d8	111%	87-117
Bromofluorobenzene	112%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	<5.0	5.0	
Vinyl Chloride	75-01-4	<5.0	5.0	
Bromomethane	74-83-9	<5.0	5.0	
Chloroethane	75-00-3	<5.0	5.0	
Trichlorofluoromethane	75-69-4	<5.0	5.0	
Acetone	67-64-1	4.1	10.	J
1,1-Dichloroethene	75-35-4	<5.0	5.0	
Carbon Disulfide	75-15-0	<5.0	5.0	
Methylene Chloride	75-09-2	<5.0	5.0	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Vinyl Acetate	108-05-4	<10.	10.	
1,1-Dichloroethane	75-34-3	<5.0	5.0	
2-Butanone	78-93-3	<10.	10.	
cis-1,2-Dichloroethene	156-59-2	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
2-Chloroethylvinylether	110-75-8	<20.	20.	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
2-Hexanone	591-78-6	<10.	10.	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Tetrachloroethene	127-18-4	<5.0	5.0	
Dibromochloromethane	124-48-1	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Method Blank	LAL Sample ID:	38561MB
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	30-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	063096-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	107%	84-122
Toluene-d8	109%	87-117
Bromofluorobenzene	111%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	<5.0	5.0	
Vinyl Chloride	75-01-4	<5.0	5.0	
Bromomethane	74-83-9	<5.0	5.0	
Chloroethane	75-00-3	<5.0	5.0	
Trichlorofluoromethane	75-69-4	<5.0	5.0	
Acetone	67-64-1	<10.	10.	
1,1-Dichloroethene	75-35-4	<5.0	5.0	
Carbon Disulfide	75-15-0	<5.0	5.0	
Methylene Chloride	75-09-2	<5.0	5.0	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Vinyl Acetate	108-05-4	<10.	10.	
1,1-Dichloroethane	75-34-3	<5.0	5.0	
2-Butanone	78-93-3	<10.	10.	
cis-1,2-Dichloroethene	156-59-2	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
2-Chloroethylvinylether	110-75-8	<20.	20.	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
2-Hexanone	591-78-6	<10.	10.	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Tetrachloroethene	127-18-4	<5.0	5.0	
Dibromochloromethane	124-48-1	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylene	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38532LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	28-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	106%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	109%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	42.	5.0	
Vinyl Chloride	75-01-4	43.	5.0	
Bromomethane	74-83-9	45.	5.0	
Chloroethane	75-00-3	22.	5.0	
Trichlorofluoromethane	75-69-4	44.	5.0	
Acetone	67-64-1	41.	10.	
1,1-Dichloroethene	75-35-4	42.	5.0	
Carbon Disulfide	75-15-0	42.	5.0	
Methylene Chloride	75-09-2	42.	5.0	
trans-1,2-Dichloroethene	156-60-5	43.	5.0	
Vinyl Acetate	108-05-4	43.	10.	
1,1-Dichloroethane	75-34-3	43.	5.0	
2-Butanone	78-93-3	45.	10.	
cis-1,2-Dichloroethene	156-59-2	44.	5.0	
Chloroform	67-66-3	44.	5.0	
1,1,1-Trichloroethane	71-55-6	44.	5.0	
Carbon tetrachloride	56-23-5	44.	5.0	
1,2-Dichloroethane	107-06-2	45.	5.0	
Benzene	71-43-2	46.	5.0	
Trichloroethene	79-01-6	48.	5.0	
1,2-Dichloropropane	78-87-5	45.	5.0	
Bromodichloromethane	75-27-4	47.	5.0	
2-Chloroethylvinylether	110-75-8	190	20.	
4-Methyl-2-Pentanone	108-10-1	50.	10.	
cis-1,3-Dichloropropene	10061-01-5	45.	5.0	
Toluene	108-88-3	47.	5.0	
trans-1,3-Dichloropropene	10061-02-6	47.	5.0	
2-Hexanone	591-78-6	53.	10.	
1,1,2-Trichloroethane	79-00-5	49.	5.0	
Tetrachloroethene	127-18-4	46.	5.0	
Dibromochloromethane	124-48-1	47.	5.0	
Chlorobenzene	108-90-7	48.	5.0	
Ethylbenzene	100-41-4	47.	5.0	
m,p-Xylene	136777-61-2	100	5.0	
o-Xylene	95-47-6	50.	5.0	
Styrene	100-42-5	50.	5.0	
Bromoform	75-25-2	50.	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	46.	5.0	
1,3-Dichlorobenzene	541-73-1	48.	5.0	
1,4-Dichlorobenzene	106-46-7	48.	5.0	
1,2-Dichlorobenzene	95-50-1	48.	5.0	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
ATILE ORGANICS BY GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38559LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	107%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	110%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	40.	5.0	
Vinyl Chloride	75-01-4	41.	5.0	
Bromomethane	74-83-9	26.	5.0	
Chloroethane	75-00-3	20.	5.0	
Trichlorofluoromethane	75-69-4	44.	5.0	
Acetone	67-64-1	43.	10.	B
1,1-Dichloroethene	75-35-4	41.	5.0	
Carbon Disulfide	75-15-0	42.	5.0	
Methylene Chloride	75-09-2	41.	5.0	
trans-1,2-Dichloroethene	156-60-5	42.	5.0	
Vinyl Acetate	108-05-4	44.	10.	
1,1-Dichloroethane	75-34-3	42.	5.0	
2-Butanone	78-93-3	43.	10.	
cis-1,2-Dichloroethene	156-59-2	43.	5.0	
Chloroform	67-66-3	43.	5.0	
1,1,1-Trichloroethane	71-55-6	43.	5.0	
Carbon tetrachloride	56-23-5	45.	5.0	
1,2-Dichloroethane	107-06-2	45.	5.0	
Benzene	71-43-2	45.	5.0	
Trichloroethene	79-01-6	44.	5.0	
1,2-Dichloropropane	78-87-5	44.	5.0	
Bromodichloromethane	75-27-4	45.	5.0	
2-Chloroethylvinylether	110-75-8	170	20.	
4-Methyl-2-Pentanone	108-10-1	46.	10.	
cis-1,3-Dichloropropene	10061-01-5	43.	5.0	
Toluene	108-88-3	46.	5.0	
trans-1,3-Dichloropropene	10061-02-6	44.	5.0	
2-Hexanone	591-78-6	49.	10.	
1,1,2-Trichloroethane	79-00-5	45.	5.0	
Tetrachloroethene	127-18-4	46.	5.0	
Dibromochloromethane	124-48-1	44.	5.0	
Chlorobenzene	108-90-7	45.	5.0	
Ethylbenzene	100-41-4	45.	5.0	
m,p-Xylene	136777-61-2	96.	5.0	
o-Xylene	95-47-6	47.	5.0	
Styrene	100-42-5	47.	5.0	
Bromoform	75-25-2	46.	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	47.	5.0	
1,3-Dichlorobenzene	541-73-1	46.	5.0	
1,4-Dichlorobenzene	106-46-7	45.	5.0	
1,2-Dichlorobenzene	95-50-1	45.	5.0	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT

\TILE ORGANICS BY GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38561LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	30-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	063096-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	108%	84-122
Toluene-d8	111%	87-117
Bromofluorobenzene	112%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	40.	5.0	
Vinyl Chloride	75-01-4	42.	5.0	
Bromomethane	74-83-9	27.	5.0	
Chloroethane	75-00-3	16.	5.0	
Trichlorofluoromethane	75-69-4	45.	5.0	
Acetone	67-64-1	45.	10.	
1,1-Dichloroethene	75-35-4	42.	5.0	
Carbon Disulfide	75-15-0	42.	5.0	
Methylene Chloride	75-09-2	41.	5.0	
trans-1,2-Dichloroethene	156-60-5	42.	5.0	
Vinyl Acetate	108-05-4	44.	10.	
1,1-Dichloroethane	75-34-3	42.	5.0	
2-Butanone	78-93-3	43.	10.	
cis-1,2-Dichloroethene	156-59-2	43.	5.0	
Chloroform	67-66-3	43.	5.0	
1,1,1-Trichloroethane	71-55-6	44.	5.0	
Carbon tetrachloride	56-23-5	47.	5.0	
1,2-Dichloroethane	107-06-2	46.	5.0	
Benzene	71-43-2	46.	5.0	
Trichloroethene	79-01-6	46.	5.0	
1,2-Dichloropropane	78-87-5	45.	5.0	
Bromodichloromethane	75-27-4	46.	5.0	
2-Chloroethylvinylether	110-75-8	170	20.	
4-Methyl-2-Pentanone	108-10-1	48.	10.	
cis-1,3-Dichloropropene	10061-01-5	45.	5.0	
Toluene	108-88-3	47.	5.0	
trans-1,3-Dichloropropene	10061-02-6	45.	5.0	
2-Hexanone	591-78-6	50.	10.	
1,1,2-Trichloroethane	79-00-5	48.	5.0	
Tetrachloroethene	127-18-4	47.	5.0	
Dibromochloromethane	124-48-1	46.	5.0	
Chlorobenzene	108-90-7	47.	5.0	
Ethylbenzene	100-41-4	47.	5.0	
m,p-Xylene	136777-61-2	98.	5.0	
o-Xylene	95-47-6	48.	5.0	
Styrene	100-42-5	48.	5.0	
Bromoform	75-25-2	48.	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	48.	5.0	
1,3-Dichlorobenzene	541-73-1	47.	5.0	
1,4-Dichlorobenzene	106-46-7	47.	5.0	
1,2-Dichlorobenzene	95-50-1	47.	5.0	

LOCKHEED ANALYTICAL SERVICES

MATRIX SPIKE DATA SUMMARY
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	C6-58	LAL Sample ID:	38532MS
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	28-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	107%	84-122
Toluene-d8	111%	87-117
Bromofluorobenzene	111%	83-118

Constituent	Spike Added ug/L	Sample Concentration ug/L	MS Concentration ug/L	% Recovery	QC Limits % Recovery
1,1-Dichloroethene	50.0	0.000	40.4	81	62-124
Benzene	50.0	0.000	44.3	89	68-128
Trichloroethene	50.0	0.000	42.6	85	65-125
Toluene	50.0	0.000	45.0	90	69-129
Chlorobenzene	50.0	0.000	43.8	88	68-128

LOCKHEED ANALYTICAL SERVICES

MATRIX SPIKE DATA SUMMARY
V` `TILE ORGANICS BY GC/MS

Client Sample ID:	C6-R04	LAL Sample ID:	38559MS
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	107%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	110%	83-118

Constituent	Spike Added ug/L	Sample Concentration ug/L	MS Concentration ug/L	% Recovery	QC Limits % Recovery
1,1-Dichloroethene	50.0	0.000	40.7	81	62-124
Benzene	50.0	0.000	43.9	88	68-128
Trichloroethene	50.0	0.000	43.1	86	65-125
Toluene	50.0	0.000	44.8	90	69-129
Chlorobenzene	50.0	0.000	44.5	89	68-128

LOCKHEED ANALYTICAL SERVICES

MATRIX SPIKE DUPLICATE DATA SUMMARY
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	C6-58	LAL Sample ID:	38532MSD
Date Collected:	20-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	28-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	108%	84-122
Toluene-d8	111%	87-117
Bromofluorobenzene	110%	83-118

Constituent	Spike Added ug/L	MSD Concentration ug/L	% Recovery	RPD	QC Limits RPD	QC Limits % Recovery
1,1-Dichloroethene	50.0	41.0	82	2	14	62-124
Benzene	50.0	45.0	90	2	11	68-128
Trichloroethene	50.0	43.5	87	2	14	65-125
Toluene	50.0	46.0	92	2	13	69-129
Chlorobenzene	50.0	45.3	91	3	13	68-128

LOCKHEED ANALYTICAL SERVICES

MATRIX SPIKE DUPLICATE DATA SUMMARY
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	C6-R04	LAL Sample ID:	38559MSD
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	107%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	110%	83-118

Constituent	Spike Added ug/L	MSD Concentration ug/L	% Recovery	RPD	QC Limits RPD	QC Limits % Recovery
1,1-Dichloroethene	50.0	43.1	86	6	14	62-124
Benzene	50.0	47.1	94	7	11	68-128
Trichloroethene	50.0	46.0	92	7	14	65-125
Toluene	50.0	47.9	96	7	13	69-129
Chlorobenzene	50.0	47.4	95	6	13	68-128

LOCKHEED ANALYTICAL SERVICES

LCS DATA SUMMARY

ATILE ORGANICS BY GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38532LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	28-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062896-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	106%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	109%	83-118

Constituent	Spike Added ug/L	LCS Concentration ug/L	LCS % Recovery	QC Limits
1,1-Dichloroethene	50.0	41.9	84	62-124
Benzene	50.0	45.8	92	68-128
Trichloroethene	50.0	47.8	96	65-125
Toluene	50.0	46.8	94	69-129
Chlorobenzene	50.0	47.8	96	68-128

LOCKHEED ANALYTICAL SERVICES

LCS DATA SUMMARY

ATILE ORGANICS BY GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38559LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	29-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	062996-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	107%	84-122
Toluene-d8	110%	87-117
Bromofluorobenzene	110%	83-118

Constituent	Spike Added ug/L	LCS Concentration ug/L	LCS % Recovery	QC Limits
1,1-Dichloroethene	50.0	41.3	83	62-124
Benzene	50.0	44.8	90	68-128
Trichloroethene	50.0	44.5	89	65-125
Toluene	50.0	45.8	92	69-129
Chlorobenzene	50.0	45.1	90	68-128

LOCKHEED ANALYTICAL SERVICES

LCS DATA SUMMARY
V :TILE ORGANICS BY GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38561LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	30-JUN-96	Analytical Dilution:	1
		Analytical Batch ID:	063096-8260-J2
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-d4	108%	84-122
Toluene-d8	111%	87-117
Bromofluorobenzene	112%	83-118

Constituent	Spike Added ug/L	LCS Concentration ug/L	LCS % Recovery	QC Limits
1,1-Dichloroethene	50.0	41.7	83	62-124
Benzene	50.0	46.5	93	68-128
Trichloroethene	50.0	45.7	91	65-125
Toluene	50.0	47.2	94	69-129
Chlorobenzene	50.0	46.5	93	68-128

OCKHEED ANALYTICAL SERVICES

VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

trument ID: GC/MS-J

Date/Time Analyzed: 28-JUN-96 15:25
LAL Batch ID: 062896-8260-J2

		IS1 (PFB) Area	RT	IS2 (DFB) Area	RT	IS3 (CBZ) Area	RT	IS4 (DCB) Area	RT
12 HOUR STD		1219666	10.50	2253245	11.61	2314245	15.63	1828351	19.64
UPPER LIMIT		2439332	11.00	4506490	12.11	4628490	16.13	3656702	20.14
LOWER LIMIT		609833	10	1126622	11.11	1157122	15.13	914175	19.14
Client Sample ID	LAL Sample ID								
ethod Blank	38532MB	1321383	10.50	2373005	11.61	2427107	15.63	1924071	19.63
-58	38532MS	1284181	10.52	2381208	11.63	2451471	15.64	1995346	19.64
-56	L7305-1	1281614	10.52	2296589	11.63	2344735	15.64	1847622	19.64
-58	L7305-4	1296600	10.51	2336549	11.62	2398587	15.64	1884986	19.64
-62	L7305-7	1277231	10.51	2277090	11.62	2350152	15.64	1829655	19.65
ab Ctrl Sample	38532LCS	1265424	10.51	2384369	11.62	2414876	15.64	1980026	19.64
-58	38532MSD	1277450	10.52	2376579	11.63	2414214	15.64	1976328	19.64
-R37	L7305-10	1259988	10.51	2282662	11.62	2317665	15.64	1840712	19.64
-51	L7305-25	1089061	10.52	1955933	11.63	2005466	15.64	1570589	19.64
-33	L7305-28	1226654	10.51	2185910	11.62	2249236	15.64	1750854	19.64
-R36	L7305-36	1235275	10.51	2211811	11.62	2272504	15.64	1790477	19.64
-D1	L7305-42	1232830	10.53	2238842	11.64	2262463	15.65	1777410	19.66
-15	L7305-51	1204846	10.51	2175724	11.62	2219926	15.64	1717159	19.64
-61	L7305-63	1209586	10.51	2187835	11.62	2220261	15.64	1788112	19.64
BS-001	L7312-13	1330394	10.51	2397724	11.63	2428926	15.64	1857086	19.64

EA UPPER LIMIT = +100% of internal standard area
EA LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5
IS4 (DCB) = 1,4-Dichlorobenzene-d4

...OCKHEED ANALYTICAL SERVICES

VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

trument ID: GC/MS-J

Date/Time Analyzed: 29-JUN-96 13:06
LAL Batch ID: 062996-8260-J2

		IS1 (PFB) Area	RT	IS2 (DFB) Area	RT	IS3 (CBZ) Area	RT	IS4 (DCB) Area	RT
12 HOUR STD		1169492	10.51	2144186	11.62	2203098	15.63	1801468	19.63
UPPER LIMIT		2338984	11.01	4288372	12.12	4406196	16.13	3602936	20.13
LOWER LIMIT		584746	10.01	1072093	11.12	1101549	15.13	900734	19.13
Client Sample ID	LAL Sample ID								
thod Blank	38559MB	1263033	10.50	2240109	11.62	2300109	15.63	1812323	19.63
-R04	38559MS	1219148	10.52	2262417	11.63	2310398	15.64	1913729	19.65
b Ctrl Sample	38559LCS	1229258	10.51	2273646	11.62	2321478	15.64	1898419	19.64
-R04	38559MSD	1175278	10.52	2176258	11.63	2220170	15.65	1819637	19.64
-64	L7305-13	1246045	10.52	2253775	11.63	2286481	15.64	1814010	19.64
-54	L7305-16	1215367	10.51	2157698	11.62	2215047	15.65	1738616	19.65
-50	L7305-19	1218511	10.52	2149830	11.63	2213297	15.64	1736714	19.65
-48	L7305-22	1201404	10.51	2150694	11.62	2209130	15.64	1768843	19.65
-R04	L7305-31	1215210	10.52	2169257	11.63	2215934	15.64	1743630	19.64
-R34	L7305-39	1242859	10.52	2210127	11.63	2247386	15.64	1759083	19.64
S-002	L7305-45	1228051	10.51	2206154	11.63	2258728	15.64	1783936	19.64
-67	L7305-54	1184610	10.52	2110334	11.63	2148679	15.64	1710044	19.64
S-003	L7305-57	1236325	10.51	2221254	11.62	2256109	15.64	1781008	19.64
S-001	L7305-60	1185499	10.52	2119800	11.63	2160425	15.64	1723704	19.64
S-004	L7312-10	1237268	10.51	2217116	11.62	2282593	15.64	1788272	19.64

A UPPER LIMIT = +100% of internal standard area
A LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5
IS4 (DCB) = 1,4-Dichlorobenzene-d4

)CKHEED ANALYTICAL SERVICES

VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

:rument ID: GC/MS-J

Date/Time Analyzed: 30-JUN-96 11:02
LAL Batch ID: 063096-8260-J2

		IS1 (PFB) Area	RT	IS2 (DFB) Area	RT	IS3 (CBZ) Area	RT	IS4 (DCB) Area	RT
12 HOUR STD		1160171	10.50	2137612	11.61	2195848	15.63	1789752	19.63
UPPER LIMIT		2320342	11.00	4275224	12.11	4391696	16.13	3579504	20.13
LOWER LIMIT		580085	10	1068806	11.11	1097924	15.13	894876	19.13
Client Sample ID	LAL Sample ID								
:hod Blank	38561MB	1234222	10.50	2204176	11.61	2249652	15.63	1805105	19.63
-76	L7312-1	1248127	10.51	2212641	11.62	2282696	15.64	1816997	19.64
-65	L7312-4	1252310	10.51	2204839	11.62	2245597	15.64	1778515	19.64
-D2	L7312-7	1218806	10.52	2166896	11.63	2209150	15.64	1720052	19.64
) Ctrl Sample	38561LCS	1196558	10.50	2173669	11.61	2243721	15.63	1840125	19.63
-34	L7305-48	1262653	10.50	2231139	11.61	2262961	15.63	1803171	19.63
-R08	L7312-16	1250272	10.52	2231306	11.63	2269493	15.64	1785087	19.64

\ UPPER LIMIT = +100% of internal standard area
\ LOWER LIMIT = -50% of internal standard area
JPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5
IS4 (DCB) = 1,4-Dichlorobenzene-d4

RUN LOGS / INJECTION LOGS

LOCKHEED ANALYTICAL LAB REVIEWED BY MS 5-31-96 INSTRUMENT ID # GCMS 0831 PAGE # 000073

ANALYST	DATE	TIME OF INJ.	LAL #	DESCRIPTION/CLIENT	SOL #	MATRIX/DIL	DATA FILE	TUNE FILE	METHOD FILE	ID FILE	DR	ACS #	COMMENTS
KM	5/21	1220	37266MB	method blank	696-73-3	soil	J2678	MJ1103	JS8260	N/A	OK	2	
		1256	37266LCS	LCS	696-73-3		79				OK	3	
		1400	L7050-26	RUST 282-MW01-9.0-10.0	696-77-3	5.02g	80				OK	4	
		1426	L7050-26	-24.0-25.0		5.04	81				OK	5	
		1512	L7050-30	-39.0-40.0		5.00	82				OK	6	
		1548	L7050-32	-59.0-60.0		5.07	83				ok	7	
KM	5/28	0856	—	50 ng BFB	696-70-1	—	J2684	MJ1103	MEJBFB	N/A	OK	N/A	
		0921	VSTD374MA	cont. calib.	696-73-1,2	soil	85		JS8260		OK	1	
		0957	37494MB	method blank	696-73-3		86				DNR	2	BTBT
		1104					87				DNR	2	Branch Lab methanol + RDL
		1140	37494LCS	LCS	696-73-3		88				DNR	3	Soln Check - Good
		1428	VSTD050	Cmpd Response Check	696-73-1,2		89				DNR	1	Cmpd response ok after maintenance.
SL	5/28	1650	—	50 ng BFB	696-70-1	—	J2690	MJ1103	MEJBFB	—	ok	-	
		1725	—	VSTD005	696-77-1,2	—	91		JS8260	—		1	All targets detected at RDL.
		1801	—	VSTD020		—	92			—		2	SOIL
		1837	—	VSTD050 (37532)		—	93			—		3	5 POINT
		1913	—	VSTD100		—	94			—		4	
		1949	—	VSTD150		—	95			—		5	GOOD
		2025	—	VSTD200		—	96			—		6	
		2101	—	BLANK	696-77-3	—	97			—	DNR	7	
		2137	—	37532MB		—	98			—	ok	8	
		2213	—	37532LCS	696-77-3 696-71-1	—	99			—	ok	9	Passes as QCCS
		2315	L7040-6	V14SD11 TT	696-77-3	5.02	J2700			—	OK	10	
KM	5/29	0943	—	50 ng BFB	696-70-1	—	J2701	MJ1103	MEJBFB JW8260	N/A	OK	N/A	
		1010	—	VSTD005	696-77-1,2	H_2O	02				OK	1	All targets detected at RDL
		1046	—	VSTD020			03				OK	2	
		1119	—	VSTD050			04					3	H_2O
		1154	—	VSTD100			05					4	5 POINT
		1230	—	VSTD150			06					5	GOOD
		1305	—	VSTD200			07					6	
		1340	—	Inst. carryover blank	696-77-3		08				DNR	7	
		1415	—				09				DNR	8	
		1448	—	QCCS	696-77-3		10				OK	9	QCCS Passes

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LOCKHEED ANALYTICAL LAB REVIEWED BY _____ INSTRUMENT ID # GC/MS J 0831 PAGE # 000078

SURR/VBT	DATE	TIME OF INJ.	LAL #	DESCRIPTION/CLIENT	SOL #	MATRIX/DIL	DATA FILE	TUNE FILE	METHOD FILE	ID FILE	DR	ACS #	COMMENTS
BR	6/26	1723	-	50 ng BFB	696-82-1	-	J2836	MJ1103	MEJBFB	-	ok	-	
		1752	-	VSTD38481	696-77-1,2	-	37		JW82600	-	ok	1	
		1829	-	38481MB	696-77-1 696-78-2	-	38			-	ok	2	
		1907	-	38481LCS	696-77-1 696-78-2	-	39			-	ok	3	
		2052	L7239	DL NBCA1039SPOIL4H	696-77-1 696-78-2	1.00	40			-	Rep	4	Report w/ J2821
		2130	38481ms		696-77-1 696-78-2	1.01	41			-	ok	5	
		2209	38481MSD			1.01	42			-	ok	6	
BR	6/27	1421	-	50 ng BFB	696-82-1	-	J2843	MJ1103	MEJBFB	—	OK	-	
		1444	-	VSTD38508	696-77-1/2	-	44		JW82600	-	ok	1	
		1511	-	38508MB	696-77-3	-	45			-	ok	2	
		1618	L7336-1	DL LAE9145-99		-	46			-	DNR	3	
		1665	L7336-2	DL LAE9043-82		-	47			-	DNR	4	
		1815	L7336-2	DL LAE9043-82		1:250	48			-	ok	8	
		1852	L7336-3	DL LAE9043-128		1:250	49			-	ok	9	
		1929	L7336-4	DL LAE8909-116		1:250	50			-	ok	10	
		2006	L7336-1	DL LAE9145-99		1:500	51			-	ok	11	
		2043	-	VSTD38508-2	696-77-1/2	-	52			-	ok	7	
		2120	-	~~DSC 4127196~~ 38508LCS	696-77-1 696-77-3	-	53			-	ok	8/2	
		2157	-	BLANK		-	54			-	DNR	43	cleanup only
		2233	-			-	55			-		44	
		2310	-			-	56			-		45	
		2347	-			-	57			-		6	
BR	6/28	1458	-	50 ng BFB	696-82-1	-	J2858	MJ1103	MEJBFB	-	ok	-	
		1525	-	VSTD38532	696-77-1/2	-	59		JW82600	-	ok	1	
		1602	-	38532MB	696-77-3	-	60			-	ok	2	
		1639	-	38532LCS	696-77-3 694-71-1	-	61			-	ok	3	
		1718	L7312-13	EBS-001	696-77-3	1:20	62			pH = 0	ok	4	BTEX ONLY
		1755	L7305-4	CL-58			63			7	ok	5	
		1832	38532MS		696-77-3 694-71-1		64			7	ok	6	
		1909	38532MSD				65			7	ok	7	
		1946	L7305-1	CL-58	696-77-3		66			7	ok	8	
		2023	L7305-7	A3-62			67			0	ok	9	

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LOCKHEED ANALYTICAL LAB REVIEWED BY _____ INSTRUMENT ID # GCMS J 0831 PAGE # 000079

SEQUENCE/LVOT	DATE	TIME OF INJ.	LAL #	DESCRIPTION/CLIENT	SOL #	MATRIX/DIL	DATA FILE	TUNE FILE	METHOD FILE	ID FILE	DR	RES #	COMMENTS
	6/28	2100	L7305-10	C6 - R37	L696-77-3	H20	J2868	MJ1103	JW8260	pH = 7	ok	10	BTEX ONLY
		2137	L7305-25	D7 - 51			69			7	ok	11	
		2214	L7305-28	D7 - 33			70			7	ok	12	
		2251	L7305-36	C6 - R36			71			7	ok	13	
		2328	L7305-42	B8 - D1			72			7	ok	14	
		0005	L7305-51	D7 - 15			73			7	ok	15	
		0042	L7305-63	B4 - 61			74			7	ok	16	
	6/29	1239	-	50 ng BCB	L696-82-1	-	J2875	MJ1103	HEJBCB	-	ok	-	
		1306	-	VSTD38560	L696-77-1/2	-	76		JW8260	-	ok	1	
		1340	-	38560MB	L696-77-3	-	77			-	ok	2	
		1415	-	38560LCS	L696-77-3 B34-71-1	-	78			-	ok	3	
		1451	L7312-10	TBS-004	L696-77-3	pH = 3	79			-	ok	4	
		1527	L7305-45	TBS-002		2	80			-	ok	5	
		1604	L7305-57	TBS-003		2	81			-	ok	6	
		1641	L7305-60	TBS-001		2	82			-	ok	7	
		1718	L7305-31	C6 - R04		7	83			-	ok	8	
		1755	38560MS		L696-77-3 B34-71-1	7	84			-	ok	9	
		1832	38560MSD			7	85			-	ok	10	
		1909	L7305-13	C2 - 64	L696-77-3	7	86			-	ok	11	
		1946	L7305-16	C7 - 54		4	87			-	ok	12	
		2023	L7305-19	D8 - 50		7	88			-	ok	13	
		2100	L7305-22	D8 - 48		7	89			-	ok	14	
		2137	L7305-35	D6 - R34		7	90			-	ok	15	
		2215	L7305-54	I3 - 67		7	91			-	ok	16	
	6/30	1036	-	50 ng BCB	L696-82-1	-	J2892	MJ1103	HEJBCB	-	ok	-	
		1102	-	VSTD38560	L696-77-1/2	-	93		JW8260	-	ok	1	
		1138	-	38560MB	L696-77-3	-	94			-	ok	2	
		1215	-	38560LCS	L696-77-3 B34-71-1	-	95			-	ok	3	
		1252	L7305-48	D7 - 34	L696-77-3	pH = 7	96			-	ok	4	
		1327	L7312-1	C4 - 76		7	97			-	ok	5	
		1406	L7312-4	C5 - 65		7	98			-	ok	6	
		1442	L7312-7	B8 - D2		7	99			-	ok	7	

EPA METHOD 8270 (Semivolatile Organics)

SAMPLE RESULTS FORMS AND QC SUMMARIES

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
'0 SEMI-VOLATILES

Client Sample ID:	C4-76	LAL Sample ID:	L7312-19
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070396-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	45%	31-110
Phenol-d5	59%	27-111
Nitrobenzene-d5	62%	40-114
2-Fluorobiphenyl	59%	41-111
2,4,6-Tribromophenol	75%	34-147
Terphenyl-d14	88%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	<10.	10.	
bis(2-Chloroethyl)ether	111-44-4	<10.	10.	
2-Chlorophenol	95-57-8	<10.	10.	
1,3-Dichlorobenzene	541-73-1	<10.	10.	
1,4-Dichlorobenzene	106-46-7	<10.	10.	
Benzyl alcohol	100-51-6	<20.	20.	
1,2-Dichlorobenzene	95-50-1	<10.	10.	
2-Methylphenol	95-48-7	<10.	10.	
bis(2-chloroisopropyl)ether	108-60-1	<10.	10.	
4-Methylphenol	106-44-5	<10.	10.	
N-Nitroso-di-n-propylamine	621-64-7	<10.	10.	
Hexachloroethane	67-72-1	<10.	10.	
Nitrobenzene	98-95-3	<10.	10.	
Isophorone	78-59-1	<10.	10.	
2-Nitrophenol	88-75-5	<10.	10.	
2,4-Dimethylphenol	105-67-9	<10.	10.	
Benzoic acid	65-85-0	<50.	50.	
bis(2-Chloroethoxy)methane	111-91-1	<10.	10.	
2,4-Dichlorophenol	120-83-2	<10.	10.	
1,2,4-Trichlorobenzene	120-82-1	<10.	10.	
Naphthalene	91-20-3	3.0	10.	J
4-Chloroaniline	106-47-8	<20.	20.	
Hexachlorobutadiene	87-68-3	<10.	10.	
4-Chloro-3-methylphenol	59-50-7	<20.	20.	
2-Methylnaphthalene	91-57-6	6.9	10.	J
Hexachlorocyclopentadiene	77-47-4	<10.	10.	
2,4,6-Trichlorophenol	88-06-2	<10.	10.	
2,4,5-Trichlorophenol	95-95-4	<10.	10.	
2-Chloronaphthalene	91-58-7	8.1	10.	J
2-Nitroaniline	88-74-4	<50.	50.	
Dimethylphthalate	131-11-3	<10.	10.	
Acenaphthylene	208-96-8	<10.	10.	
2,6-Dinitrotoluene	606-20-2	<10.	10.	
3-Nitroaniline	99-09-2	<50.	50.	
Acenaphthene	83-32-9	9.2	10.	J
2,4-Dinitrophenol	51-28-5	<50.	50.	
4-Nitrophenol	100-02-7	<50.	50.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
8270 SEMI-VOLATILES

Client Sample ID:	C4-76	LAL Sample ID:	L7312-19
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070396-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	<10.	10.	
2,4-Dinitrotoluene	121-14-2	<10.	10.	
Diethylphthalate	84-66-2	<10.	10.	
4-Chlorophenyl-phenylether	7005-72-3	<10.	10.	
Fluorene	86-73-7	<10.	10.	
4-Nitroaniline	100-01-6	<20.	20.	
4,6-Dinitro-2-methylphenol	534-52-1	<50.	50.	
N-Nitrosodiphenylamine (1)	86-30-6	<10.	10.	
4-Bromophenyl-phenylether	101-55-3	<10.	10.	
Hexachlorobenzene	118-74-1	<10.	10.	
Pentachlorophenol	87-86-5	<50.	50.	
Phenanthrene	85-01-8	<10.	10.	
Anthracene	120-12-7	<10.	10.	
Carbazole	86-74-8	<10.	10.	
Di-n-butylphthalate	84-74-2	<10.	10.	
Fluoranthene	206-44-0	<10.	10.	
Pyrene	129-00-0	<10.	10.	
Butylbenzylphthalate	85-68-7	<10.	10.	
3,3'-Dichlorobenzidine	91-94-1	<20.	20.	
Benzo(a)anthracene	56-55-3	<10.	10.	
Chrysene	218-01-9	<10.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	3.8	10.	J
Di-n-octylphthalate	117-84-0	<10.	10.	
Benzo(b)fluoranthene	205-99-2	<10.	10.	
Benzo(k)fluoranthene	207-08-9	<10.	10.	
Benzo(a)pyrene	50-32-8	<10.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	<10.	10.	
Dibenz(a,h)anthracene	53-70-3	<10.	10.	
Benzo(g,h,i)perylene	191-24-2	<10.	10.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
8270 SEMI-VOLATILES

Client Sample ID:	C3-65	LAL Sample ID:	L7312-21
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	46%	31-110
Phenol-d5	58%	27-111
Nitrobenzene-d5	63%	40-114
2-Fluorobiphenyl	53%	41-111
2,4,6-Tribromophenol	92%	34-147
Terphenyl-d14	82%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	<10.	10.	
bis(2-Chloroethyl)ether	111-44-4	<10.	10.	
2-Chlorophenol	95-57-8	<10.	10.	
1,3-Dichlorobenzene	541-73-1	<10.	10.	
1,4-Dichlorobenzene	106-46-7	<10.	10.	
Benzyl alcohol	100-51-6	<20.	20.	
1,2-Dichlorobenzene	95-50-1	<10.	10.	
2-Methylphenol	95-48-7	<10.	10.	
bis(2-chloroisopropyl)ether	108-60-1	<10.	10.	
4-Methylphenol	106-44-5	<10.	10.	
N-Nitroso-di-n-propylamine	621-64-7	<10.	10.	
Hexachloroethane	67-72-1	<10.	10.	
Nitrobenzene	98-95-3	<10.	10.	
Isophorone	78-59-1	<10.	10.	
2-Nitrophenol	88-75-5	<10.	10.	
2,4-Dimethylphenol	105-67-9	<10.	10.	
Benzoic acid	65-85-0	<50.	50.	
bis(2-Chloroethoxy)methane	111-91-1	<10.	10.	
2,4-Dichlorophenol	120-83-2	<10.	10.	
1,2,4-Trichlorobenzene	120-82-1	<10.	10.	
Naphthalene	91-20-3	3.3	10.	J
4-Chloroaniline	106-47-8	<20.	20.	
Hexachlorobutadiene	87-68-3	<10.	10.	
4-Chloro-3-methylphenol	59-50-7	<20.	20.	
2-Methylnaphthalene	91-57-6	7.8	10.	J
Hexachlorocyclopentadiene	77-47-4	<10.	10.	
2,4,6-Trichlorophenol	88-06-2	<10.	10.	
2,4,5-Trichlorophenol	95-95-4	<10.	10.	
2-Chloronaphthalene	91-58-7	<10.	10.	
2-Nitroaniline	88-74-4	<50.	50.	
Dimethylphthalate	131-11-3	<10.	10.	
Acenaphthylene	208-96-8	<10.	10.	
2,6-Dinitrotoluene	606-20-2	<10.	10.	
3-Nitroaniline	99-09-2	<50.	50.	
Acenaphthene	83-32-9	9.0	10.	J
2,4-Dinitrophenol	51-28-5	<50.	50.	
4-Nitrophenol	100-02-7	<50.	50.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
8270 SEMI-VOLATILES

Client Sample ID:	C3-65	LAL Sample ID:	L7312-21
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	<10.	10.	
2,4-Dinitrotoluene	121-14-2	<10.	10.	
Diethylphthalate	84-66-2	<10.	10.	
4-Chlorophenyl-phenylether	7005-72-3	<10.	10.	
Fluorene	86-73-7	<10.	10.	
4-Nitroaniline	100-01-6	<20.	20.	
4,6-Dinitro-2-methylphenol	534-52-1	<50.	50.	
N-Nitrosodiphenylamine (1)	86-30-6	<10.	10.	
4-Bromophenyl-phenylether	101-55-3	<10.	10.	
Hexachlorobenzene	118-74-1	<10.	10.	
Pentachlorophenol	87-86-5	<50.	50.	
Phenanthrene	85-01-8	<10.	10.	
Anthracene	120-12-7	<10.	10.	
Carbazole	86-74-8	<10.	10.	
Di-n-butylphthalate	84-74-2	<10.	10.	
Fluoranthene	206-44-0	<10.	10.	
Pyrene	129-00-0	<10.	10.	
Butylbenzylphthalate	85-68-7	<10.	10.	
3,3'-Dichlorobenzidine	91-94-1	<20.	20.	
Benzo(a)anthracene	56-55-3	<10.	10.	
Chrysene	218-01-9	<10.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	3.7	10.	J
Di-n-octylphthalate	117-84-0	<10.	10.	
Benzo(b)fluoranthene	205-99-2	<10.	10.	
Benzo(k)fluoranthene	207-08-9	<10.	10.	
Benzo(a)pyrene	50-32-8	<10.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	<10.	10.	
Dibenz(a,h)anthracene	53-70-3	<10.	10.	
Benzo(g,h,i)perylene	191-24-2	<10.	10.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
8270 SEMI-VOLATILES

Client Sample ID:	B8-D2	LAL Sample ID:	L7312-23
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	51%	31-110
Phenol-d5	61%	27-111
Nitrobenzene-d5	59%	40-114
2-Fluorobiphenyl	50%	41-111
2,4,6-Tribromophenol	96%	34-147
Terphenyl-d14	71%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	<10.	10.	
bis(2-Chloroethyl)ether	111-44-4	<10.	10.	
2-Chlorophenol	95-57-8	<10.	10.	
1,3-Dichlorobenzene	541-73-1	<10.	10.	
1,4-Dichlorobenzene	106-46-7	<10.	10.	
Benzyl alcohol	100-51-6	<20.	20.	
1,2-Dichlorobenzene	95-50-1	<10.	10.	
2-Methylphenol	95-48-7	<10.	10.	
bis(2-chloroisopropyl)ether	108-60-1	<10.	10.	
4-Methylphenol	106-44-5	<10.	10.	
N-Nitroso-di-n-propylamine	621-64-7	<10.	10.	
Hexachloroethane	67-72-1	<10.	10.	
Nitrobenzene	98-95-3	<10.	10.	
Isophorone	78-59-1	<10.	10.	
2-Nitrophenol	88-75-5	<10.	10.	
2,4-Dimethylphenol	105-67-9	<10.	10.	
Benzoic acid	65-85-0	<50.	50.	
bis(2-Chloroethoxy)methane	111-91-1	<10.	10.	
2,4-Dichlorophenol	120-83-2	<10.	10.	
1,2,4-Trichlorobenzene	120-82-1	<10.	10.	
Naphthalene	91-20-3	<10.	10.	
4-Chloroaniline	106-47-8	<20.	20.	
Hexachlorobutadiene	87-68-3	<10.	10.	
4-Chloro-3-methylphenol	59-50-7	<20.	20.	
2-Methylnaphthalene	91-57-6	<10.	10.	
Hexachlorocyclopentadiene	77-47-4	<10.	10.	
2,4,6-Trichlorophenol	88-06-2	<10.	10.	
2,4,5-Trichlorophenol	95-95-4	<10.	10.	
2-Chloronaphthalene	91-58-7	<10.	10.	
2-Nitroaniline	88-74-4	<50.	50.	
Dimethylphthalate	131-11-3	<10.	10.	
Acenaphthylene	208-96-8	<10.	10.	
2,6-Dinitrotoluene	606-20-2	<10.	10.	
3-Nitroaniline	99-09-2	<50.	50.	
Acenaphthene	83-32-9	<10.	10.	
2,4-Dinitrophenol	51-28-5	<50.	50.	
4-Nitrophenol	100-02-7	<50.	50.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
70 SEMI-VOLATILES

Client Sample ID:	B8-D2	LAL Sample ID:	L7312-23
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	<10.	10.	
2,4-Dinitrotoluene	121-14-2	<10.	10.	
Diethylphthalate	84-66-2	<10.	10.	
4-Chlorophenyl-phenylether	7005-72-3	<10.	10.	
Fluorene	86-73-7	<10.	10.	
4-Nitroaniline	100-01-6	<20.	20.	
4,6-Dinitro-2-methylphenol	534-52-1	<50.	50.	
N-Nitrosodiphenylamine (1)	86-30-6	<10.	10.	
4-Bromophenyl-phenylether	101-55-3	<10.	10.	
Hexachlorobenzene	118-74-1	<10.	10.	
Pentachlorophenol	87-86-5	<50.	50.	
Phenanthrene	85-01-8	<10.	10.	
Anthracene	120-12-7	<10.	10.	
Carbazole	86-74-8	<10.	10.	
Di-n-butylphthalate	84-74-2	<10.	10.	
Fluoranthene	206-44-0	<10.	10.	
Pyrene	129-00-0	<10.	10.	
Butylbenzylphthalate	85-68-7	<10.	10.	
3,3'-Dichlorobenzidine	91-94-1	<20.	20.	
Benzo(a)anthracene	56-55-3	<10.	10.	
Chrysene	218-01-9	<10.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	<10.	10.	
Di-n-octylphthalate	117-84-0	<10.	10.	
Benzo(b)fluoranthene	205-99-2	<10.	10.	
Benzo(k)fluoranthene	207-08-9	<10.	10.	
Benzo(a)pyrene	50-32-8	<10.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	<10.	10.	
Dibenz(a,h)anthracene	53-70-3	<10.	10.	
Benzo(g,h,i)perylene	191-24-2	<10.	10.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
70 SEMI-VOLATILES

Client Sample ID:	B5-R08	LAL Sample ID:	L7312-27
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	6.9% *	31-110
Phenol-d5	16% *	27-111
Nitrobenzene-d5	53%	40-114
2-Fluorobiphenyl	46%	41-111
2,4,6-Tribromophenol	35%	34-147
Terphenyl-d14	88%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	<10.	10.	
bis(2-Chloroethyl)ether	111-44-4	<10.	10.	
2-Chlorophenol	95-57-8	<10.	10.	
1,3-Dichlorobenzene	541-73-1	<10.	10.	
1,4-Dichlorobenzene	106-46-7	<10.	10.	
Benzyl alcohol	100-51-6	<20.	20.	
1,2-Dichlorobenzene	95-50-1	<10.	10.	
2-Methylphenol	95-48-7	<10.	10.	
bis(2-chloroisopropyl)ether	108-60-1	<10.	10.	
4-Methylphenol	106-44-5	<10.	10.	
N-Nitroso-di-n-propylamine	621-64-7	<10.	10.	
Hexachloroethane	67-72-1	<10.	10.	
Nitrobenzene	98-95-3	<10.	10.	
Isophorone	78-59-1	<10.	10.	
2-Nitrophenol	88-75-5	<10.	10.	
2,4-Dimethylphenol	105-67-9	<10.	10.	
Benzoic acid	65-85-0	<50.	50.	
bis(2-Chloroethoxy)methane	111-91-1	<10.	10.	
2,4-Dichlorophenol	120-83-2	<10.	10.	
1,2,4-Trichlorobenzene	120-82-1	<10.	10.	
Naphthalene	91-20-3	<10.	10.	
4-Chloroaniline	106-47-8	<20.	20.	
Hexachlorobutadiene	87-68-3	<10.	10.	
4-Chloro-3-methylphenol	59-50-7	<20.	20.	
2-Methylnaphthalene	91-57-6	7.1	10.	J
Hexachlorocyclopentadiene	77-47-4	<10.	10.	
2,4,6-Trichlorophenol	88-06-2	<10.	10.	
2,4,5-Trichlorophenol	95-95-4	<10.	10.	
2-Chloronaphthalene	91-58-7	7.0	10.	J
2-Nitroaniline	88-74-4	<50.	50.	
Dimethylphthalate	131-11-3	<10.	10.	
Acenaphthylene	208-96-8	<10.	10.	
2,6-Dinitrotoluene	606-20-2	<10.	10.	
3-Nitroaniline	99-09-2	<50.	50.	
Acenaphthene	83-32-9	8.1	10.	J
2,4-Dinitrophenol	51-28-5	<50.	50.	
4-Nitrophenol	100-02-7	<50.	50.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
70 SEMI-VOLATILES

Client Sample ID:	B5-R08	LAL Sample ID:	L7312-27
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	<10.	10.	
2,4-Dinitrotoluene	121-14-2	<10.	10.	
Diethylphthalate	84-66-2	<10.	10.	
4-Chlorophenyl-phenylether	7005-72-3	<10.	10.	
Fluorene	86-73-7	<10.	10.	
4-Nitroaniline	100-01-6	<20.	20.	
4,6-Dinitro-2-methylphenol	534-52-1	<50.	50.	
N-Nitrosodiphenylamine (1)	86-30-6	2.9	10.	J
4-Bromophenyl-phenylether	101-55-3	<10.	10.	
Hexachlorobenzene	118-74-1	<10.	10.	
Pentachlorophenol	87-86-5	<50.	50.	
Phenanthrene	85-01-8	<10.	10.	
Anthracene	120-12-7	<10.	10.	
Carbazole	86-74-8	<10.	10.	
Di-n-butylphthalate	84-74-2	<10.	10.	
Fluoranthene	206-44-0	<10.	10.	
Pyrene	129-00-0	<10.	10.	
Butylbenzylphthalate	85-68-7	<10.	10.	
3,3'-Dichlorobenzidine	91-94-1	<20.	20.	
Benzo(a)anthracene	56-55-3	<10.	10.	
Chrysene	218-01-9	<10.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	<10.	10.	
Di-n-octylphthalate	117-84-0	<10.	10.	
Benzo(b)fluoranthene	205-99-2	<10.	10.	
Benzo(k)fluoranthene	207-08-9	<10.	10.	
Benzo(a)pyrene	50-32-8	<10.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	<10.	10.	
Dibenz(a,h)anthracene	53-70-3	<10.	10.	
Benzo(g,h,i)perylene	191-24-2	<10.	10.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
8270 SEMI-VOLATILES

Client Sample ID:	B5-R08	LAL Sample ID:	L7312-27
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070396-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	28% *	31-110
Phenol-d5	57%	27-111
Nitrobenzene-d5	64%	40-114
2-Fluorobiphenyl	57%	41-111
2,4,6-Tribromophenol	50%	34-147
Terphenyl-d14	85%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	<10.	10.	
bis(2-Chloroethyl)ether	111-44-4	<10.	10.	
2-Chlorophenol	95-57-8	<10.	10.	
1,3-Dichlorobenzene	541-73-1	<10.	10.	
1,4-Dichlorobenzene	106-46-7	<10.	10.	
Benzyl alcohol	100-51-6	<20.	20.	
1,2-Dichlorobenzene	95-50-1	<10.	10.	
2-Methylphenol	95-48-7	<10.	10.	
bis(2-chloroisopropyl)ether	108-60-1	<10.	10.	
4-Methylphenol	106-44-5	<10.	10.	
N-Nitroso-di-n-propylamine	621-64-7	<10.	10.	
Hexachloroethane	67-72-1	<10.	10.	
Nitrobenzene	98-95-3	<10.	10.	
Isophorone	78-59-1	<10.	10.	
2-Nitrophenol	88-75-5	<10.	10.	
2,4-Dimethylphenol	105-67-9	<10.	10.	
Benzoic acid	65-85-0	<50.	50.	
bis(2-Chloroethoxy)methane	111-91-1	<10.	10.	
2,4-Dichlorophenol	120-83-2	<10.	10.	
1,2,4-Trichlorobenzene	120-82-1	<10.	10.	
Naphthalene	91-20-3	<10.	10.	
4-Chloroaniline	106-47-8	<20.	20.	
Hexachlorobutadiene	87-68-3	<10.	10.	
4-Chloro-3-methylphenol	59-50-7	<20.	20.	
2-Methylnaphthalene	91-57-6	<10.	10.	
Hexachlorocyclopentadiene	77-47-4	<10.	10.	
2,4,6-Trichlorophenol	88-06-2	<10.	10.	
2,4,5-Trichlorophenol	95-95-4	<10.	10.	
2-Chloronaphthalene	91-58-7	<10.	10.	
2-Nitroaniline	88-74-4	<50.	50.	
Dimethylphthalate	131-11-3	<10.	10.	
Acenaphthylene	208-96-8	<10.	10.	
2,6-Dinitrotoluene	606-20-2	<10.	10.	
3-Nitroaniline	99-09-2	<50.	50.	
Acenaphthene	83-32-9	<10.	10.	
2,4-Dinitrophenol	51-28-5	<50.	50.	
4-Nitrophenol	100-02-7	<50.	50.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS
'0 SEMI-VOLATILES

Client Sample ID:	B5-R08	LAL Sample ID:	L7312-27
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	03-JUL-96	Date Extracted:	27-JUN-96
Matrix:	Water	Analytical Batch ID:	070396-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	<10.	10.	
2,4-Dinitrotoluene	121-14-2	<10.	10.	
Diethylphthalate	84-66-2	<10.	10.	
4-Chlorophenyl-phenylether	7005-72-3	<10.	10.	
Fluorene	86-73-7	<10.	10.	
4-Nitroaniline	100-01-6	<20.	20.	
4,6-Dinitro-2-methylphenol	534-52-1	<50.	50.	
N-Nitrosodiphenylamine (1)	86-30-6	<10.	10.	
4-Bromophenyl-phenylether	101-55-3	<10.	10.	
Hexachlorobenzene	118-74-1	<10.	10.	
Pentachlorophenol	87-86-5	<50.	50.	
Phenanthrene	85-01-8	<10.	10.	
Anthracene	120-12-7	<10.	10.	
Carbazole	86-74-8	<10.	10.	
Di-n-butylphthalate	84-74-2	<10.	10.	
Fluoranthene	206-44-0	<10.	10.	
Pyrene	129-00-0	<10.	10.	
Butylbenzylphthalate	85-68-7	<10.	10.	
3,3'-Dichlorobenzidine	91-94-1	<20.	20.	
Benzo(a)anthracene	56-55-3	<10.	10.	
Chrysene	218-01-9	<10.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	<10.	10.	
Di-n-octylphthalate	117-84-0	<10.	10.	
Benzo(b)fluoranthene	205-99-2	<10.	10.	
Benzo(k)fluoranthene	207-08-9	<10.	10.	
Benzo(a)pyrene	50-32-8	<10.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	<10.	10.	
Dibenz(a,h)anthracene	53-70-3	<10.	10.	
Benzo(g,h,i)perylene	191-24-2	<10.	10.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Method Blank	LAL Sample ID:	38495MB
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070296-8270-A
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	21% *	31-110
Phenol-d5	30%	27-111
Nitrobenzene-d5	43%	40-114
2-Fluorobiphenyl	41%	41-111
2,4,6-Tribromophenol	45%	34-147
Terphenyl-d14	78%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	<10.	10.	
bis(2-Chloroethyl)ether	111-44-4	<10.	10.	
2-Chlorophenol	95-57-8	<10.	10.	
1,3-Dichlorobenzene	541-73-1	<10.	10.	
1,4-Dichlorobenzene	106-46-7	<10.	10.	
Benzyl alcohol	100-51-6	<20.	20.	
1,2-Dichlorobenzene	95-50-1	<10.	10.	
2-Methylphenol	95-48-7	<10.	10.	
bis(2-chloroisopropyl)ether	108-60-1	<10.	10.	
4-Methylphenol	106-44-5	<10.	10.	
N-Nitroso-di-n-propylamine	621-64-7	<10.	10.	
Hexachloroethane	67-72-1	<10.	10.	
Nitrobenzene	98-95-3	<10.	10.	
Isophorone	78-59-1	<10.	10.	
2-Nitrophenol	88-75-5	<10.	10.	
2,4-Dimethylphenol	105-67-9	<10.	10.	
Benzoic acid	65-85-0	<50.	50.	
bis(2-Chloroethoxy)methane	111-91-1	<10.	10.	
2,4-Dichlorophenol	120-83-2	<10.	10.	
1,2,4-Trichlorobenzene	120-82-1	<10.	10.	
Naphthalene	91-20-3	<10.	10.	
4-Chloroaniline	106-47-8	<20.	20.	
Hexachlorobutadiene	87-68-3	<10.	10.	
4-Chloro-3-methylphenol	59-50-7	<20.	20.	
2-Methylnaphthalene	91-57-6	<10.	10.	
Hexachlorocyclopentadiene	77-47-4	<10.	10.	
2,4,6-Trichlorophenol	88-06-2	<10.	10.	
2,4,5-Trichlorophenol	95-95-4	<10.	10.	
2-Chloronaphthalene	91-58-7	<10.	10.	
2-Nitroaniline	88-74-4	<50.	50.	
Dimethylphthalate	131-11-3	<10.	10.	
Acenaphthylene	208-96-8	<10.	10.	
2,6-Dinitrotoluene	606-20-2	<10.	10.	
3-Nitroaniline	99-09-2	<50.	50.	
Acenaphthene	83-32-9	<10.	10.	
2,4-Dinitrophenol	51-28-5	<50.	50.	
4-Nitrophenol	100-02-7	<50.	50.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Method Blank	LAL Sample ID:	38495MB
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	<10.	10.	
2,4-Dinitrotoluene	121-14-2	<10.	10.	
Diethylphthalate	84-66-2	<10.	10.	
4-Chlorophenyl-phenylether	7005-72-3	<10.	10.	
Fluorene	86-73-7	<10.	10.	
4-Nitroaniline	100-01-6	<20.	20.	
4,6-Dinitro-2-methylphenol	534-52-1	<50.	50.	
N-Nitrosodiphenylamine (1)	86-30-6	<10.	10.	
4-Bromophenyl-phenylether	101-55-3	<10.	10.	
Hexachlorobenzene	118-74-1	<10.	10.	
Pentachlorophenol	87-86-5	<50.	50.	
Phenanthrene	85-01-8	<10.	10.	
Anthracene	120-12-7	<10.	10.	
Carbazole	86-74-8	<10.	10.	
Di-n-butylphthalate	84-74-2	<10.	10.	
Fluoranthene	206-44-0	<10.	10.	
Pyrene	129-00-0	<10.	10.	
Butylbenzylphthalate	85-68-7	<10.	10.	
3,3'-Dichlorobenzidine	91-94-1	<20.	20.	
Benzo(a)anthracene	56-55-3	<10.	10.	
Chrysene	218-01-9	<10.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	<10.	10.	
Di-n-octylphthalate	117-84-0	<10.	10.	
Benzo(b)fluoranthene	205-99-2	<10.	10.	
Benzo(k)fluoranthene	207-08-9	<10.	10.	
Benzo(a)pyrene	50-32-8	<10.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	<10.	10.	
Dibenz(a,h)anthracene	53-70-3	<10.	10.	
Benzo(g,h,i)perylene	191-24-2	<10.	10.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Method Blank	LAL Sample ID:	38495MB
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	03-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070396-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	20% *	31-110
Phenol-d5	29%	27-111
Nitrobenzene-d5	46%	40-114
2-Fluorobiphenyl	44%	41-111
2,4,6-Tribromophenol	38%	34-147
Terphenyl-d14	110%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	<10.	10.	
bis(2-Chloroethyl)ether	111-44-4	<10.	10.	
2-Chlorophenol	95-57-8	<10.	10.	
1,3-Dichlorobenzene	541-73-1	<10.	10.	
1,4-Dichlorobenzene	106-46-7	<10.	10.	
Benzyl alcohol	100-51-6	<20.	20.	
1,2-Dichlorobenzene	95-50-1	<10.	10.	
2-Methylphenol	95-48-7	<10.	10.	
bis(2-chloroisopropyl)ether	108-60-1	<10.	10.	
4-Methylphenol	106-44-5	<10.	10.	
N-Nitroso-di-n-propylamine	621-64-7	<10.	10.	
Hexachloroethane	67-72-1	<10.	10.	
Nitrobenzene	98-95-3	<10.	10.	
Isophorone	78-59-1	<10.	10.	
2-Nitrophenol	88-75-5	<10.	10.	
2,4-Dimethylphenol	105-67-9	<10.	10.	
Benzoic acid	65-85-0	<50.	50.	
bis(2-Chloroethoxy)methane	111-91-1	<10.	10.	
2,4-Dichlorophenol	120-83-2	<10.	10.	
1,2,4-Trichlorobenzene	120-82-1	<10.	10.	
Naphthalene	91-20-3	<10.	10.	
4-Chloroaniline	106-47-8	<20.	20.	
Hexachlorobutadiene	87-68-3	<10.	10.	
4-Chloro-3-methylphenol	59-50-7	<20.	20.	
2-Methylnaphthalene	91-57-6	<10.	10.	
Hexachlorocyclopentadiene	77-47-4	<10.	10.	
2,4,6-Trichlorophenol	88-06-2	<10.	10.	
2,4,5-Trichlorophenol	95-95-4	<10.	10.	
2-Chloronaphthalene	91-58-7	<10.	10.	
2-Nitroaniline	88-74-4	<50.	50.	
Dimethylphthalate	131-11-3	<10.	10.	
Acenaphthylene	208-96-8	<10.	10.	
2,6-Dinitrotoluene	606-20-2	<10.	10.	
3-Nitroaniline	99-09-2	<50.	50.	
Acenaphthene	83-32-9	<10.	10.	
2,4-Dinitrophenol	51-28-5	<50.	50.	
4-Nitrophenol	100-02-7	<50.	50.	

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Method Blank	LAL Sample ID:	38495MB
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	03-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070396-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	<10.	10.	
2,4-Dinitrotoluene	121-14-2	<10.	10.	
Diethylphthalate	84-66-2	<10.	10.	
4-Chlorophenyl-phenylether	7005-72-3	<10.	10.	
Fluorene	86-73-7	<10.	10.	
4-Nitroaniline	100-01-6	<20.	20.	
4,6-Dinitro-2-methylphenol	534-52-1	<50.	50.	
N-Nitrosodiphenylamine (1)	86-30-6	<10.	10.	
4-Bromophenyl-phenylether	101-55-3	<10.	10.	
Hexachlorobenzene	118-74-1	<10.	10.	
Pentachlorophenol	87-86-5	<50.	50.	
Phenanthrene	85-01-8	<10.	10.	
Anthracene	120-12-7	<10.	10.	
Carbazole	86-74-8	<10.	10.	
Di-n-butylphthalate	84-74-2	<10.	10.	
Fluoranthene	206-44-0	<10.	10.	
Pyrene	129-00-0	<10.	10.	
Butylbenzylphthalate	85-68-7	<10.	10.	
3,3'-Dichlorobenzidine	91-94-1	<20.	20.	
Benzo(a)anthracene	56-55-3	<10.	10.	
Chrysene	218-01-9	<10.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	<10.	10.	
Di-n-octylphthalate	117-84-0	<10.	10.	
Benzo(b)fluoranthene	205-99-2	<10.	10.	
Benzo(k)fluoranthene	207-08-9	<10.	10.	
Benzo(a)pyrene	50-32-8	<10.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	<10.	10.	
Dibenz(a,h)anthracene	53-70-3	<10.	10.	
Benzo(g,h,i)perylene	191-24-2	<10.	10.	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38495LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	32%	31-110
Phenol-d5	49%	27-111
Nitrobenzene-d5	64%	40-114
2-Fluorobiphenyl	67%	41-111
2,4,6-Tribromophenol	78%	34-147
Terphenyl-d14	88%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Phenol	108-95-2	56.	10.	
bis(2-Chloroethyl)ether	111-44-4	56.	10.	
2-Chlorophenol	95-57-8	40.	10.	
1,3-Dichlorobenzene	541-73-1	26.	10.	
1,4-Dichlorobenzene	106-46-7	28.	10.	
Benzyl alcohol	100-51-6	71.	20.	
1,2-Dichlorobenzene	95-50-1	28.	10.	
2-Methylphenol	95-48-7	64.	10.	
bis(2-chloroisopropyl)ether	108-60-1	37.	10.	
4-Methylphenol	106-44-5	66.	10.	
N-Nitroso-di-n-propylamine	621-64-7	71.	10.	
Hexachloroethane	67-72-1	25.	10.	
Nitrobenzene	98-95-3	53.	10.	
Isophorone	78-59-1	81.	10.	
2-Nitrophenol	88-75-5	29.	10.	
2,4-Dimethylphenol	105-67-9	67.	10.	
Benzoic acid	65-85-0	8.1	50.	J
bis(2-Chloroethoxy)methane	111-91-1	68.	10.	
2,4-Dichlorophenol	120-83-2	46.	10.	
1,2,4-Trichlorobenzene	120-82-1	27.	10.	
Naphthalene	91-20-3	31.	10.	
4-Chloroaniline	106-47-8	90.	20.	
Hexachlorobutadiene	87-68-3	25.	10.	
4-Chloro-3-methylphenol	59-50-7	80.	20.	
2-Methylnaphthalene	91-57-6	33.	10.	
Hexachlorocyclopentadiene	77-47-4	<10.	10.	
2,4,6-Trichlorophenol	88-06-2	56.	10.	
2,4,5-Trichlorophenol	95-95-4	58.	10.	
2-Chloronaphthalene	91-58-7	37.	10.	
2-Nitroaniline	88-74-4	92.	50.	
Dimethylphthalate	131-11-3	83.	10.	
Acenaphthylene	208-96-8	52.	10.	
2,6-Dinitrotoluene	606-20-2	85.	10.	
3-Nitroaniline	99-09-2	95.	50.	
Acenaphthene	83-32-9	53.	10.	
2,4-Dinitrophenol	51-28-5	26.	50.	J
4-Nitrophenol	100-02-7	51.	50.	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38495LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Dibenzofuran	132-64-9	67.	10.	
2,4-Dinitrotoluene	121-14-2	85.	10.	
Diethylphthalate	84-66-2	88.	10.	
4-Chlorophenyl-phenylether	7005-72-3	72.	10.	
Fluorene	86-73-7	77.	10.	
4-Nitroaniline	100-01-6	100	20.	
4,6-Dinitro-2-methylphenol	534-52-1	37.	50.	J
N-Nitrosodiphenylamine (1)	86-30-6	84.	10.	
4-Bromophenyl-phenylether	101-55-3	71.	10.	
Hexachlorobenzene	118-74-1	86.	10.	
Pentachlorophenol	87-86-5	57.	50.	
Phenanthrene	85-01-8	86.	10.	
Anthracene	120-12-7	86.	10.	
Carbazole	86-74-8	95.	10.	
Di-n-butylphthalate	84-74-2	87.	10.	
Fluoranthene	206-44-0	94.	10.	
Pyrene	129-00-0	82.	10.	
Butylbenzylphthalate	85-68-7	84.	10.	
3,3'-Dichlorobenzidine	91-94-1	110	20.	
Benzo(a)anthracene	56-55-3	89.	10.	
Chrysene	218-01-9	88.	10.	
bis(2-Ethylhexyl)phthalate	117-81-7	88.	10.	
Di-n-octylphthalate	117-84-0	77.	10.	
Benzo(b)fluoranthene	205-99-2	83.	10.	
Benzo(k)fluoranthene	207-08-9	83.	10.	
Benzo(a)pyrene	50-32-8	86.	10.	
Indeno(1,2,3-cd)pyrene	193-39-5	90.	10.	
Dibenz(a,h)anthracene	53-70-3	90.	10.	
Benzo(g,h,i)perylene	191-24-2	93.	10.	

LOCKHEED ANALYTICAL SERVICES

MATRIX SPIKE DATA SUMMARY
SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	C6-RO4	LAL Sample ID:	38495MS
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	55%	31-110
Phenol-d5	66%	27-111
Nitrobenzene-d5	62%	40-114
2-Fluorobiphenyl	62%	41-111
2,4,6-Tribromophenol	88%	34-147
Terphenyl-d14	41%	33-141

Constituent	Spike Added ug/L	Sample Concentration ug/L	MS Concentration ug/L	% Recovery	QC Limits % Recovery
Phenol	101	0.000	74.2	73	11-118
2-Chlorophenol	101	0.000	60.0	59	19-123
1,4-Dichlorobenzene	101	0.000	25.0	25	13-110
N-Nitroso-di-n-propylamine	101	0.000	60.7	60	35-125
1,2,4-Trichlorobenzene	101	0.000	32.6	32	19-113
[illegible]loro-3-methylphenol	101	0.000	78.2	77	28-134
A[illegible]naphthene	101	0.000	71.1	70	46-116
4-Nitrophenol	101	0.000	92.8	92	10-125
2,4-Dinitrotoluene	101	0.000	89.6	89	33-133
Pentachlorophenol	101	0.000	87.3	86	10-162
Pyrene	101	0.000	72.6	72	60-123

LOCKHEED ANALYTICAL SERVICES

MATRIX SPIKE DUPLICATE DATA SUMMARY
SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	C6-RO4	LAL Sample ID:	38495MSD
Date Collected:	21-JUN-96	Date Received:	24-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	57%	31-110
Phenol-d5	90%	27-111
Nitrobenzene-d5	89%	40-114
2-Fluorobiphenyl	78%	41-111
2,4,6-Tribromophenol	100%	34-147
Terphenyl-d14	61%	33-141

Constituent	Spike Added ug/L	MSD Concentration ug/L	% Recovery	RPD	QC Limits RPD	QC Limits % Recovery
Phenol	101	102	101	32	42	11-118
2-Chlorophenol	101	80.1	79	29	40	19-123
1,4-Dichlorobenzene	101	36.0	36	36*	28	13-110
N-Nitroso-di-n-propylamine	101	92.6	92	42*	38	35-125
1 2,4-Trichlorobenzene	101	46.1	46	34*	28	19-113
[illegible]loro-3-methylphenol	101	104	103	28	42	28-134
Acenaphthene	101	88.1	87	21	31	46-116
4-Nitrophenol	101	94.2	93	1	50	10-125
2,4-Dinitrotoluene	101	114	113	24	38	33-133
Pentachlorophenol	101	105	104	18	50	10-162
Pyrene	101	88.4	88	20	31	60-123

LOCKHEED ANALYTICAL SERVICES

LCS DATA SUMMARY
SEMI-VOLATILE ORGANICS BY GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38495LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	02-JUL-96	Date Extracted:	27-JUN-96
		Analytical Batch ID:	070296-8270-K
QC Group:	8270 SEMI-VOLATILES_38495	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
2-Fluorophenol	32%	31-110
Phenol-d5	49%	27-111
Nitrobenzene-d5	64%	40-114
2-Fluorobiphenyl	67%	41-111
2,4,6-Tribromophenol	78%	34-147
Terphenyl-d14	88%	33-141

Constituent	Spike Added ug/L	LCS Concentration ug/L	LCS % Recovery	QC Limits
Phenol	100	56.0	56	11-118
2-Chlorophenol	100	40.0	40	19-123
1,4-Dichlorobenzene	100	27.6	28	13-110
N-Nitroso-di-n-propylamine	100	70.7	71	35-125
1,2,4-Trichlorobenzene	100	26.6	27	19-113
4-Chloro-3-methylphenol	100	79.9	80	28-134
Acenaphthene	100	52.5	53	46-116
4-Nitrophenol	100	51.2	51	10-125
2,4-Dinitrotoluene	100	84.6	85	33-133
Pentachlorophenol	100	56.8	57	10-162
Pyrene	100	82.4	82	60-123

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

Instrument ID: hpk

Date/Time Analyzed: 02-JUL-96 08:05

LAL Batch ID: 070296-8270-K

		IS1 Area	RT	IS2 Area	RT	IS3 Area	RT
12 HOUR STD		332990	5.530	1044441	6.867	476551	9.378
UPPER LIMIT		665980	6.030	2088882	7.367	953102	9.878
LOWER LIMIT		166495	5.03	522221	6.367	238276	8.878
Client Sample ID	LAL Sample ID						
Method Blank	38495MB	189767	5.529	611933	6.861	295296	9.375
Lab Ctrl Sample	38495LCS	192582	5.531	592817	6.867	285961	9.377
C6-RO4	38495MS	217813	5.532	613417	6.859	284133	9.384
C6-RO4	38495MSD	289689	5.533	895769	6.862	449250	9.383
C2-64	L7305-103	239178	5.530	795070	6.863	443100	9.379
D8-50	L7305-105	295114	5.528	941633	6.870	395727	9.386
D8-48	L7305-106	225316	5.531	726190	6.864	361844	9.381
C6-R04	L7305-107	258352	5.532	819583	6.867	395129	9.378
C3-65	L7312-21	321578	5.535	998957	6.863	515119	9.389
B8-D2	L7312-23	210905	5.530	686158	6.862	358475	9.387
B5-R08	L7312-27	220734	5.533	654036	6.869	317494	9.388
I3-67	L7305-112	233140	5.532	722877	6.867	344728	9.381
C7-54	L7305-104	375641	5.532	1111901	6.867	526480	9.388
D8-48	L7305-106	223633	5.531	645166	6.865	295889	9.381

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

IS1 = 1,4-DICHLOROBENZENE-D4
IS2 = NAPHTHALENE-D8
IS3 = ACENAPHTHENE-D10

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

nstrument ID: hpk

Date/Time Analyzed: 02-JUL-96 08:05
LAL Batch ID: 070296-8270-K

		IS4 Area	RT	IS5 Area	RT	IS6 Area	RT
12 HOUR STD		601023	12.016	377550	17.224	361265	19.859
UPPER LIMIT		1202046	12.516	755100	17.724	722530	20.359
LOWER LIMIT		300512	11.516	188775	16.724	180633	19.359
Client Sample ID	LAL Sample ID						
Method Blank	38495MB	397284	12.008	256237	17.214	291905	19.856
Lab Ctrl Sample	38495LCS	374255	12.015	276481	17.216	300274	19.861
C6-RO4	38495MS	373841	12.019	276025	17.217	290569	19.855
C6-RO4	38495MSD	568980	12.018	417115	17.233	449693	19.868
C2-64	L7305-103	575594	12.017	331290	17.212	342413	19.860
D8-50	L7305-105	414640	12.021	262552	17.229	275914	19.867
D8-48	L7305-106	454291	12.015	297512	17.213	303491	19.858
C6-R04	L7305-107	440616	12.019	286162	17.214	297037	19.861
C3-65	L7312-21	640282	12.023	388839	17.224	408976	19.863
B8-D2	L7312-23	489056	12.021	266795	17.217	287387	19.861
B5-R08	L7312-27	397699	12.021	271260	17.223	276904	19.860
I3-67	L7305-112	449063	12.021	311914	17.222	353302	19.873
C7-54	L7305-104	576648	12.022	253478	17.229	251667	19.865
D8-48	L7305-106	380034	12.024	238076	17.222	250664	19.866

EA UPPER LIMIT = +100% of internal standard area
EA LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS4 = PHENANTHRENE-D10
IS5 = CHRYSENE-D12
IS6 = PERYLENE-D12

000079

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

nstrument ID: hpk

Date/Time Analyzed: 02-JUL-96 08:05
LAL Batch ID: 070296-8270-K

		IS1 Area	RT	IS2 Area	RT	IS3 Area	RT
12 HOUR STD		332990	5.530	1044441	6.867	476551	9.378
UPPER LIMIT		665980	6.030	2088882	7.367	953102	9.878
LOWER LIMIT		166495	5.03	522221	6.367	238276	8.878
Client Sample ID	LAL Sample ID						

REA UPPER LIMIT = +100% of internal standard area
REA LOWER LIMIT = -50% of internal standard area
T UPPER LIMIT = +0.50 minutes of internal standard RT
T LOWER LIMIT = -0.50 minutes of internal standard RT

IS1 = 1,4-DICHLOROBENZENE-D4
IS2 = NAPHTHALENE-D8
IS3 = ACENAPHTHENE-D10

LOCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD

AREA AND RT SUMMARY

nstrument ID: hpk

Date/Time Analyzed: 02-JUL-96 08:05

LAL Batch ID: 070296-8270-K

	IS4 Area	RT	IS5 Area	RT	IS6 Area	RT
12 HOUR STD	601023	12.016	377550	17.224	361265	19.859
UPPER LIMIT	1202046	12.516	755100	17.724	722530	20.359
LOWER LIMIT	300512	11.516	188775	16.724	180633	19.359
Client Sample ID / LAL Sample ID						

REA UPPER LIMIT = +100% of internal standard area
REA LOWER LIMIT = -50% of internal standard area
T UPPER LIMIT = +0.50 minutes of internal standard RT
T LOWER LIMIT = -0.50 minutes of internal standard RT

IS4 = PHENANTHRENE-D10
IS5 = CHRYSENE-D12
IS6 = PERYLENE-D12

...OCKHI D ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

...trument ID: hpk

Date/Time Analyzed: 03-JUL-96 08:58
LAL Batch ID: 070396-8270-K

		IS1 Area	RT	IS2 Area	RT	IS3 Area	RT
12 HOUR STD		659867	5.523	1913548	6.853	766495	9.368
UPPER LIMIT		1319734	6.023	3827096	7.353	1532990	9.868
LOWER LIMIT		329934	5.023	956774	6.353	383248	8.868
Client Sample ID	LAL Sample ID						
...thod Blank	38495MB	510376	5.520	1609670	6.842	655053	9.366
...R34	L7305-110	466650	5.523	1324170	6.860	467756	9.374
...76	L7312-19	626017	5.518	1882166	6.849	776891	9.369
...R08	L7312-27	638477	5.514	1963851	6.850	877943	9.364
...34	L7305-111	566109	5.515	1734585	6.852	702319	9.360
...67	L7305-112	656994	5.523	1951963	6.847	845112	9.365

...UPPER LIMIT = +100% of internal standard area
...LOWER LIMIT = -50% of internal standard area
...PPER LIMIT = +0.50 minutes of internal standard RT
...OWER LIMIT = -0.50 minutes of internal standard RT

IS1 = 1,4-DICHLOROBENZENE-D4
IS2 = NAPHTHALENE-D8
IS3 = ACENAPHTHENE-D10

)CKHE D ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

rument ID: hpk

Date/Time Analyzed: 03-JUL-96 08:58
LAL Batch ID: 070396-8270-K

		IS4 Area	RT	IS5 Area	RT	IS6 Area	RT
12 HOUR STD		805850	11.999	347447	17.200	293213	19.846
UPPER LIMIT		1611700	12.499	694894	17.700	586426	20.346
LOWER LIMIT		402925	11.499	173724	16.700	146607	19.346
Client Sample ID	LAL Sample ID						
hod Blank	38495MB	691491	11.998	239481	17.192	233107	19.834
R34	L7305-110	445797	12.016	228790	17.205	236333	19.850
76	L7312-19	772413	12.005	349425	17.200	340168	19.842
R08	L7312-27	942229	11.996	395306	17.200	406272	19.838
34	L7305-111	652087	11.995	305403	17.204	312671	19.848
67	L7305-112	781711	12.003	378424	17.195	348901	19.846

UPPER LIMIT = +100% of internal standard area
LOWER LIMIT = -50% of internal standard area
PPER LIMIT = +0.50 minutes of internal standard RT
OWER LIMIT = -0.50 minutes of internal standard RT

IS4 = PHENANTHRENE-D10
IS5 = CHRYSENE-D12
IS6 = PERYLENE-D12

RUN LOGS/EXTRACTION SHEETS

EED ANALYTICAL SERVICES REVIEWED BY _____ INSTRUMENT ID GC-MS K OR L LOGBOOK# LAL-96-LOG-0900 PAGE # 000023

DATE OF INJ.	TIME OF INJ.	LE ID	DESCRIPTION/ CLIENT SAMPLE ID	SOLUTION ID	MATRIX/ DILUTION	DATA FILE	D	METHOD FILE	TAPE ID	DR?	COMMENTS
6/28	1809	L7337-1 38515MSD	BLD69085.CB1-50	0339-36-3		S1901019	Kjun2896	K8240klp.m		DNR	
	1844	L7337-1				S1D01020				OK	
	1913	L7337-2	BLD69085.CB2-25			S2101021				DNR	
	1946	L7337-2	BLD69085.CB2-25			S2201022				OK	
	2018	L7337-3	BLD69085.CB3-25			S2301023				DNR	
	2047	L7337-3	BLD69085.CB3-25			S2401024				OK	
	2120	L7337-3b	↓	N/A		S2501025				DNR	
	2152	blank	—			S2601026					
	2224		N/A			S2701027					
	2256					S2801028					
	2329					S2901029					
	0001					S3001030					
	0033					S3101031					
↓	0105	↓	↓	↓		S3201032	↓	↓		↓	
7/1	1015		DFTPP + 4 50ng Tune	0339-32-7 0339-36-3 0339-34-2		S0101001	Kjul0196	Klelvadftpp		OK	
	1115		S0TD0701196K			S0201002		K8240klp.m		DNR	
	1501	blank	—	0334-36-3		S0301003				DNR	
	1527		IC160701196K	0339-36-3 0339-34-5		S0401004				OK	
	1636	1559	IC120701196K	-4		S0501005					good 8270 5pt Calibration 7/2/96 dp
	1631		IC080701196K	-3		S0601006					
	1703		IC050701196K	-2		S0701007					
	1736		IC020701196K	-1		S0801008					
↓	1808	blank	—	0339-36-3		S0901009	↓	↓		DNR	
7/2	0753		DFTPP + 4 50ng Tune	0339-32-7 0339-34-2 0339-36-3		S0101001	Kjul0296	Klelvadftpp.m		OK	
	0805		S0TD0702296K			S0201002		K8240klp.m		OK	
	0838	L7339-1	BLD69085.CB1-50	0339-36-3		S0301003				DNR	
	0912	38515MSD	↓			S0401004				DNR	
0915	1014	38495MB	blank			S0501005				Rep	w/38495MB on 07/396-8270-K
1014	1046	38495LCS	LCS			S0601006				OK	
↓	1116	38495MS	CC-R04	↓		S0701007	↓	↓		OK	

Reportable? (DR?) Column: DNR = Do Not Report; Rep = Report (QC failure, report with another analysis); OK = Report (No QC failure)

GC/MS SVOA UNIX

EED ANALYTICAL SERVICES REVIEWED BY ______ INSTRUMENT ID [illegible] K OR L LOGBOOK# LAL-98-LOG-0900 PAGE # 000024

DATE OF INJ.	TIME OF INJ.	LAS SAMPLE ID	DESCRIPTION/ CLIENT SAMPLE ID	SOLUTION ID	MATRIX/ DILUTION	DATA FILE	BATCH ID	METHOD FILE	TAPE ID	DR?	COMMENTS
7/2	1119	38445MSD	C6-R04	0339-36-3		S0801008	KJul0296	K8290tclp.m		OK	
	1154	L7305-103	C2-64			S0901009				OK	
	1224	L7305-104	C7-54			S1001010				OK	
	1256	~~38445~~ ~~L7305-103~~	~~D8-50~~ L7305-105 D8-50			S1101011				OK	
	1330	L7305-106	D8-48			S1201012				Rep	w/L7305-106 RE in 070396-8270-K
	1400	L7305-107	C6-R04			S1301013				OK	
	1433	L7305-110	D6-R34			S1401014				DNR	
	1504	L7312-19	C4-76			S1501015				DNR	
	1537	L7312-21	C3-65			S1601016				OK	
	1610	L7312-23	B8-D2			S1701017				OK	
	1641	L7312-27	B5-R08			S1801018				Rep	w/L7312-27 RE in 070396-8290-K
	1714	L7305-111 ~~L7312-[illegible]~~	D7-34			S1901019				Rep	w/ ~~L7[illegible]~~ L7305-111 RE in 070296-8270-K
	1747	L7305-112	I3-67			S2001020				Rep	w/L7305-112 RE in 070296-8270-K
		~~L7305-105~~	~~D8-50~~			~~S2101021~~					[illegible]
7/2	1818	38445 LCS ~~MB~~ RE	LCS			S2101021				DNR	
7/2	1850	L7305-104 RE	C7-54			S2201022				OK	
7/2	1922	L7305-106 RE	D8-48			S2301023				Rep	w/L7305-106 in 070296-8290-K
7/2	1954	L7305-110 RE	D6-R34			S2401024				DNR	
7/2	2026	Sur CK	0859-27-2			S2501025				Rep	Report to Prep Lab internal use only
7/2	2058	Spike CK	0859-27-3			S2601026				Rep	
7/3	0847		Sony DFTPP+4	0334-32-7		S0101001	KJul0396	K[illegible]		OK	
	0858		SS[illegible]070396K	0339-34-2 0339-36-3		S0201002		K8270tclp.m		OK	
	0937	38445MBRE	blank	0339-36-3		S0301003				Rep	w 38445 MB RE in 070296-8270-K
	1003	L7305-110 RE	D6-R34			S0401004				OK	
	1037	L7312-19 RE	C4-76			S0501005				OK	
	1108	L7312-27 RE	B5-R08			S0601006				Rep	w/L7312-27 in 070396-8270-K
	1139	L7305-111 RE	D7-34			S0701007				Rep	w/L7305-111 in 070296-8270-K
	1212	L7305-112 RE	I3-67			S0801008				Rep	w/L7305-112 in 070296-8270-K
	1331	38547MB	blank			S0901009				OK	
	1357	38547LCS	LCS			S1001010				OK	

Reportable? (DR?) Column: DNR = Do Not Report; Rep = Report (QC failure, report with another analysis); OK = Report (No QC failure)

FULL MATRIX SPIKE

LOCKHEED ANALYTICAL SERVICES

TRACKING SHEET DATA REPORT (bs08)

EXTRACTION SHEET FOR: 8270 SEMI-VOLATILES Extraction

WORKSHEET NUMBER: 8270 SEMI-VOLATILES_38495

Continuous

HT= 06/21
DUE 07/04

L #	QC TYPE	CLIENT ID	DATE COLLECTED	DATE RECEIVED/ CREATED	VOL/WT EXTRACT	WATER SAMPLE pH	SURR ML	MS ML	1ST COOK FINAL VOL MLS	TOTAL VOL ON GPC	2ND COOK FINAL VOL MLS	BROUGHT TO FINAL VOLUME OF	AMT GIVEN TO ANALYST
				VKL 6/27/96					AZ 06-2496				
305-103		C2-64	20-JUN-96	24-JUN-96	1000	7	1ml		0.5ml	N/A	N/A	1ml	~1 ml
305-104		C7-54	20-JUN-96	24-JUN-96	1000								
305-105		D8-50	20-JUN-96	24-JUN-96	780								
305-106		D8-48	20-JUN-96	24-JUN-96	1000								
305-107		C6-R04	21-JUN-96	24-JUN-96	1000								
305-110		D6-R34	21-JUN-96	24-JUN-96	910								
305-111		D7-34	21-JUN-96	24-JUN-96	990								
305-112		I3-67	21-JUN-96	24-JUN-96	1000								
312-19		C4-76	24-JUN-96	25-JUN-96	1000								
312-21		C3-65	24-JUN-96	25-JUN-96	1000								
312-23		B8-D2	24-JUN-96	25-JUN-96	1000								
312-27		B5-R08	24-JUN-96	25-JUN-96	1000								
95MB	MB	Method Blank		27-JUN-96	1000								

CONTINUOUS EXTRACTION
EXTRACTION STARTED : 06-27-96 EXTRACTION COMPLETED : 06-29-96

DATE & TIME STARTED (acid): 6-27-96 @ 7:00pm DATE & TIME COMPLETED (acid): 6/28/96 1pm SP

DATE & TIME STARTED (BN) : 6-28-96 2:10pm SP DATE & TIME COMPLETED (BN) : 6-29-96 8:10am MW

BATCH# : 8270 SEMI-VOLATILES_38495 LOT #'S

SURR ID # : 0859-24-3 CONC: 100/150 µg/mL MECL2 : 36073

MS ID # : 0766-38-5 CONC: 100 µg/mL ACETONE: N/A NA2SO4 : K05649

SIGNED: Vicki Underwood

SIGNED: Anita Zamora

SPIKED WITNESS: Johnny Lin

SIGNED:

REVIEWED BY: Quality Burns 07-01-96

EXTRACT COC: RECIEVED BY: DATE: 7-9-96

ALL SAMPLES ADJUSTED TO <2. VKL 06-27-96 Condensor line was inadvertently when another set of samples was removed at 9AM 6/28/96. All samples went to in the round bottoms. Samples were cooled at 10:30AM and additional MeCl2 added, >10 w/10N NaOH 6/28/96 SP SP 6/28/96

LOCKHEED ANALYTICAL SERVICES

TRACKING SHEET DATA REPORT (bs08)

EXTRACTION SHEET FOR: 8270 SEMI-VOLATILES Extraction

WORKSHEET NUMBER: 8270 SEMI-VOLATILES_38495

#	QC TYPE	CLIENT ID	DATE COLLECTED	DATE RECEIVED/ CREATED	VOA/WT EXTR	WATER SAMPLE pH	SURR ML	MS ML	1ST COOK FINAL VOL MLS	TOTAL VOL ON GPC	2ND COOK FINAL VOL MLS	BROUGHT TO FINAL VOLUME OF	AMT GIVEN TO ANALYST
95LCS	LCS	Lab Ctrl Sample		27-JUN-96	1000	7	1ml	1ml	0.5ml	N/A	N/A	1 ml	~1 ml
95MS L7305-108	MS	MS/MSD	21-JUN-96	24-JUN-96	1000								
95MSD L7305-109	MSD	MS/MSD	21-JUN-96	24-JUN-96	1000								
~~KELOT38495~~	~~SPIKELOT~~	~~Spike Lot Sample~~		~~27-JUN-96~~							JLB 06-27-96		

INUOUS EXTRACTION
ACTION STARTED : _____ EXTRACTION COMPLETED : _____

& TIME STARTED (acid): _____ DATE & TIME COMPLETED (acid): _____ SIGNED: _____

& TIME STARTED (BN) : _____ DATE & TIME COMPLETED (BN) : _____ SIGNED: _____

ATCH# : 8270 SEMI-VOLATILES_38495 LOT #'S SPIKED WITNESS: _____

ID # : _____ CONC: _____ MECL2 : _____ SIGNED: _____

D # : _____ CONC: _____ ACETONE: _____ NA2SO4 : _____

REVIEWED BY: _____

ATIVE EXTRACT COC: RECIEVED BY: _____ DATE: _____

EPA METHOD 8270 (Semivolatile Organics)
Selective Ion Monitoring (SIM)

SAMPLE RESULTS FORMS AND QC SUMMARIES

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
) SIM

Client Sample ID:	EBS-001	LAL Sample ID:	L7312-25
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	01-JUL-96	Date Extracted:	28-JUN-96
Matrix:	Water	Analytical Batch ID:	070196-8270-L
QC Group:	8270 SIM_38524	Analytical Dilution:	1
		Preparation Dilution:	1.05

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	95%	40-114
2-Fluorobiphenyl	82%	41-111
Terphenyl-d14	105%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(S)
Naphthalene	91-20-3	<0.42	0.42	
Acenaphthylene	208-96-8	<0.11	0.11	
Acenaphthene	83-32-9	<0.11	0.11	
Fluorene	86-73-7	<0.11	0.11	
Phenanthrene	85-01-8	<0.11	0.11	
Anthracene	120-12-7	<0.11	0.11	
Fluoranthene	206-44-0	<0.11	0.11	
Pyrene	129-00-0	<0.11	0.11	
Benzo(a)anthracene	56-55-3	<0.11	0.11	
Chrysene	218-01-9	<0.11	0.11	
Benzo(b)fluoranthene	205-99-2	<0.11	0.11	
Benzo(k)fluoranthene	207-08-9	<0.11	0.11	
Benzo(a)pyrene	50-32-8	<0.11	0.11	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.11	0.11	
Dibenz(a,h)anthracene	53-70-3	<0.11	0.11	
Benzo(g,h,i)perylene	191-24-2	<0.11	0.11	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
) SIM

Client Sample ID:	C4-76	LAL Sample ID:	L7312-29
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	01-JUL-96	Date Extracted:	28-JUN-96
Matrix:	Water	Analytical Batch ID:	070196-8270-L
QC Group:	8270 SIM_38524	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	84%	40-114
2-Fluorobiphenyl	66%	41-111
Terphenyl-d14	100%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	5.0	0.40	
Acenaphthylene	208-96-8	1.7	0.10	
Acenaphthene	83-32-9	10.	0.10	E
Fluorene	86-73-7	1.3	0.10	
Phenanthrene	85-01-8	0.27	0.10	
Anthracene	120-12-7	0.58	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	0.17	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	<0.10	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
'0 SIM

Client Sample ID:	C4-76	LAL Sample ID:	L7312-29
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	02-JUL-96	Date Extracted:	28-JUN-96
Matrix:	Water	Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38524	Analytical Dilution:	2
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	85%	40-114
2-Fluorobiphenyl	76%	41-111
Terphenyl-d14	101%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	5.1	0.81	
Acenaphthylene	208-96-8	1.9	0.20	
Acenaphthene	83-32-9	12.	0.20	
Fluorene	86-73-7	1.4	0.20	
Phenanthrene	85-01-8	0.33	0.20	
Anthracene	120-12-7	0.62	0.20	
Fluoranthene	206-44-0	<0.20	0.20	
Pyrene	129-00-0	0.28	0.20	
Benzo(a)anthracene	56-55-3	<0.20	0.20	
Chrysene	218-01-9	<0.20	0.20	
Benzo(b)fluoranthene	205-99-2	<0.20	0.20	
Benzo(k)fluoranthene	207-08-9	<0.20	0.20	
Benzo(a)pyrene	50-32-8	<0.20	0.20	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.20	0.20	
Dibenz(a,h)anthracene	53-70-3	<0.20	0.20	
Benzo(g,h,i)perylene	191-24-2	<0.20	0.20	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
'0 SIM

Client Sample ID:	C3-65	LAL Sample ID:	L7312-30
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	01-JUL-96	Date Extracted:	28-JUN-96
Matrix:	Water	Analytical Batch ID:	070196-8270-L
QC Group:	8270 SIM_38524	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	101%	40-114
2-Fluorobiphenyl	80%	41-111
Terphenyl-d14	100%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	<0.40	0.40	
Acenaphthylene	208-96-8	<0.10	0.10	
Acenaphthene	83-32-9	<0.10	0.10	
Fluorene	86-73-7	<0.10	0.10	
Phenanthrene	85-01-8	<0.10	0.10	
Anthracene	120-12-7	<0.10	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	<0.10	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	<0.10	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
) SIM

Client Sample ID:	B8-D2	LAL Sample ID:	L7312-31
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	01-JUL-96	Date Extracted:	28-JUN-96
Matrix:	Water	Analytical Batch ID:	070196-8270-L
QC Group:	8270 SIM_38524	Analytical Dilution:	1
		Preparation Dilution:	1.08

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	92%	40-114
2-Fluorobiphenyl	71%	41-111
Terphenyl-d14	98%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	4.4	0.43	
Acenaphthylene	208-96-8	1.6	0.11	
Acenaphthene	83-32-9	9.8	0.11	
Fluorene	86-73-7	1.2	0.11	
Phenanthrene	85-01-8	0.23	0.11	
Anthracene	120-12-7	0.35	0.11	
Fluoranthene	206-44-0	<0.11	0.11	
Pyrene	129-00-0	0.16	0.11	
Benzo(a)anthracene	56-55-3	<0.11	0.11	
Chrysene	218-01-9	<0.11	0.11	
Benzo(b)fluoranthene	205-99-2	<0.11	0.11	
Benzo(k)fluoranthene	207-08-9	<0.11	0.11	
Benzo(a)pyrene	50-32-8	<0.11	0.11	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.11	0.11	
Dibenz(a,h)anthracene	53-70-3	<0.11	0.11	
Benzo(g,h,i)perylene	191-24-2	<0.11	0.11	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS
( ) SIM

Client Sample ID:	B5-R08	LAL Sample ID:	L7312-32
Date Collected:	24-JUN-96	Date Received:	25-JUN-96
Date Analyzed:	01-JUL-96	Date Extracted:	28-JUN-96
Matrix:	Water	Analytical Batch ID:	070196-8270-L
QC Group:	8270 SIM_38524	Analytical Dilution:	1
		Preparation Dilution:	1.01

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	104%	40-114
2-Fluorobiphenyl	80%	41-111
Terphenyl-d14	111%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	<0.40	0.40	
Acenaphthylene	208-96-8	<0.10	0.10	
Acenaphthene	83-32-9	<0.10	0.10	
Fluorene	86-73-7	<0.10	0.10	
Phenanthrene	85-01-8	<0.10	0.10	
Anthracene	120-12-7	<0.10	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	0.17	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	<0.10	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

SVOAS BY SIM GC/MS

Client Sample ID:	Method Blank	LAL Sample ID:	38524MB
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	01-JUL-96	Date Extracted:	28-JUN-96
		Analytical Batch ID:	070196-8270-L
QC Group:	8270 SIM_38524	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	87%	40-114
2-Fluorobiphenyl	77%	41-111
Terphenyl-d14	107%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	<0.40	0.40	
Acenaphthylene	208-96-8	<0.10	0.10	
Acenaphthene	83-32-9	<0.10	0.10	
Fluorene	86-73-7	<0.10	0.10	
Phenanthrene	85-01-8	<0.10	0.10	
Anthracene	120-12-7	<0.10	0.10	
Fluoranthene	206-44-0	<0.10	0.10	
Pyrene	129-00-0	<0.10	0.10	
Benzo(a)anthracene	56-55-3	<0.10	0.10	
Chrysene	218-01-9	<0.10	0.10	
Benzo(b)fluoranthene	205-99-2	<0.10	0.10	
Benzo(k)fluoranthene	207-08-9	<0.10	0.10	
Benzo(a)pyrene	50-32-8	<0.10	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	<0.10	0.10	
Dibenz(a,h)anthracene	53-70-3	<0.10	0.10	
Benzo(g,h,i)perylene	191-24-2	<0.10	0.10	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
SVOAS BY SIM GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38524LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	01-JUL-96	Date Extracted:	28-JUN-96
		Analytical Batch ID:	070196-8270-L
QC Group:	8270 SIM_38524	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	97%	40-114
2-Fluorobiphenyl	82%	41-111
Terphenyl-d14	104%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	3.3	0.40	
Acenaphthylene	208-96-8	3.4	0.10	
Acenaphthene	83-32-9	3.5	0.10	
Fluorene	86-73-7	3.7	0.10	
Phenanthrene	85-01-8	3.8	0.10	
Anthracene	120-12-7	3.6	0.10	
Fluoranthene	206-44-0	4.1	0.10	
Pyrene	129-00-0	3.8	0.10	
Benzo(a)anthracene	56-55-3	3.8	0.10	
Chrysene	218-01-9	3.8	0.10	
Benzo(b)fluoranthene	205-99-2	4.2	0.10	
Benzo(k)fluoranthene	207-08-9	3.8	0.10	
Benzo(a)pyrene	50-32-8	3.6	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	3.5	0.10	
Dibenz(a,h)anthracene	53-70-3	3.4	0.10	
Benzo(g,h,i)perylene	191-24-2	3.5	0.10	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
SVOAS BY SIM GC/MS

Client Sample ID:	Lab Ctrl Sample Dup	LAL Sample ID:	38524LCSDUP
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	01-JUL-96	Date Extracted:	28-JUN-96
		Analytical Batch ID:	070196-8270-L
QC Group:	8270 SIM_38524	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	7.5% *	40-114
2-Fluorobiphenyl	44%	41-111
Terphenyl-d14	109%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	0.50	0.40	
Acenaphthylene	208-96-8	2.6	0.10	
Acenaphthene	83-32-9	2.8	0.10	
Fluorene	86-73-7	3.7	0.10	
Phenanthrene	85-01-8	4.0	0.10	
Anthracene	120-12-7	3.9	0.10	
Fluoranthene	206-44-0	4.3	0.10	
Pyrene	129-00-0	4.1	0.10	
Benzo(a)anthracene	56-55-3	4.1	0.10	
Chrysene	218-01-9	4.2	0.10	
Benzo(b)fluoranthene	205-99-2	4.4	0.10	
Benzo(k)fluoranthene	207-08-9	3.9	0.10	
Benzo(a)pyrene	50-32-8	3.9	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	3.5	0.10	
Dibenz(a,h)anthracene	53-70-3	3.4	0.10	
Benzo(g,h,i)perylene	191-24-2	3.7	0.10	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
SVOAS BY SIM GC/MS

Client Sample ID:	Lab Ctrl Sample Dup	LAL Sample ID:	38524LCSDUP
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	02-JUL-96	Date Extracted:	28-JUN-96
		Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38524	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	10% *	40-114
2-Fluorobiphenyl	45%	41-111
Terphenyl-d14	111%	33-141

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Naphthalene	91-20-3	0.49	0.40	
Acenaphthylene	208-96-8	2.5	0.10	
Acenaphthene	83-32-9	2.7	0.10	
Fluorene	86-73-7	3.5	0.10	
Phenanthrene	85-01-8	3.9	0.10	
Anthracene	120-12-7	3.8	0.10	
Fluoranthene	206-44-0	4.0	0.10	
Pyrene	129-00-0	4.3	0.10	
Benzo(a)anthracene	56-55-3	4.1	0.10	
Chrysene	218-01-9	4.1	0.10	
Benzo(b)fluoranthene	205-99-2	4.1	0.10	
Benzo(k)fluoranthene	207-08-9	4.0	0.10	
Benzo(a)pyrene	50-32-8	3.9	0.10	
Indeno(1,2,3-cd)pyrene	193-39-5	3.5	0.10	
Dibenz(a,h)anthracene	53-70-3	3.4	0.10	
Benzo(g,h,i)perylene	191-24-2	3.7	0.10	

LOCKHEED ANALYTICAL SERVICES

LCS DATA SUMMARY
SVOAS BY SIM GC/MS

Client Sample ID:	Lab Ctrl Sample	LAL Sample ID:	38524LCS
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	01-JUL-96	Date Extracted:	28-JUN-96
		Analytical Batch ID:	070196-8270-L
QC Group:	8270 SIM_38524	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	97%	40-114
2-Fluorobiphenyl	82%	41-111
Terphenyl-d14	104%	33-141

Constituent	Spike Added ug/L	LCS Concentration ug/L	LCS % Recovery	QC Limits
Naphthalene	4.00	3.34	84	60-130
Acenaphthylene	4.00	3.41	85	60-130
Acenaphthene	4.00	3.48	87	60-130
Fluorene	4.00	3.72	93	60-130
Phenanthrene	4.00	3.79	95	60-130
Anthracene	4.00	3.56	89	60-130
Fluoranthene	4.00	4.06	102	60-130
Pyrene	4.00	3.75	94	60-130
Benzo(a)anthracene	4.00	3.79	95	60-130
Chrysene	4.00	3.83	96	60-130
Benzo(b)fluoranthene	4.00	4.15	104	60-130
Benzo(k)fluoranthene	4.00	3.82	96	60-130
Benzo(a)pyrene	4.00	3.60	90	60-130
Indeno(1,2,3-cd)pyrene	4.00	3.46	87	60-130
Dibenz(a,h)anthracene	4.00	3.43	86	60-130
Benzo(g,h,i)perylene	4.00	3.54	89	60-130

LOCKHEED ANALYTICAL SERVICES

LCS DUPLICATE DATA SUMMARY
SVOAS BY SIM GC/MS

Client Sample ID:	Lab Ctrl Sample Dup	LAL Sample ID:	38524LCSDUP
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	01-JUL-96	Date Extracted:	28-JUN-96
		Analytical Batch ID:	070196-8270-L
QC Group:	8270 SIM_38524	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	7.5% *	40-114
2-Fluorobiphenyl	44%	41-111
Terphenyl-d14	109%	33-141

Constituent	Spike Added ug/L	LCS DUP Concentration ug/L	% Recovery	RPD	QC Limits RPD	QC Limits % Recovery
Naphthalene	4.00	0.503	13*	148*	50	60-130
Acenaphthylene	4.00	2.56	64	28	50	60-130
Acenaphthene	4.00	2.76	69	23	50	60-130
Fluorene	4.00	3.70	93	1	50	60-130
Phenanthrene	4.00	3.96	99	4	50	60-130
Anthracene	4.00	3.85	96	8	50	60-130
Fluoranthene	4.00	4.28	107	5	50	60-130
Pyrene	4.00	4.09	102	9	50	60-130
nzo(a)anthracene	4.00	4.11	103	8	50	60-130
nrysene	4.00	4.16	104	8	50	60-130
Benzo(b)fluoranthene	4.00	4.35	109	5	50	60-130
Benzo(k)fluoranthene	4.00	3.87	97	1	50	60-130
Benzo(a)pyrene	4.00	3.91	98	8	50	60-130
Indeno(1,2,3-cd)pyrene	4.00	3.54	89	2	50	60-130
Dibenz(a,h)anthracene	4.00	3.39	85	1	50	60-130
Benzo(g,h,i)perylene	4.00	3.67	92	4	50	60-130

LOCKHEED ANALYTICAL SERVICES

LCS DUPLICATE DATA SUMMARY
SVOAS BY SIM GC/MS

Client Sample ID:	Lab Ctrl Sample Dup	LAL Sample ID:	38524LCSDUP
Date Collected:	N/A	Date Received:	N/A
Date Analyzed:	02-JUL-96	Date Extracted:	28-JUN-96
		Analytical Batch ID:	070296-8270-L
QC Group:	8270 SIM_38524	Analytical Dilution:	1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
Nitrobenzene-d5	10% *	40-114
2-Fluorobiphenyl	45%	41-111
Terphenyl-d14	111%	33-141

Constituent	Spike Added ug/L	LCS DUP Concentration ug/L	% Recovery	RPD	QC Limits RPD	QC Limits % Recovery
Naphthalene	4.00	0.493	12*	149*	50	60-130
Acenaphthylene	4.00	2.52	63	30	50	60-130
Acenaphthene	4.00	2.68	67	26	50	60-130
Fluorene	4.00	3.54	89	5	50	60-130
Phenanthrene	4.00	3.92	98	3	50	60-130
Anthracene	4.00	3.78	95	6	50	60-130
Fluoranthene	4.00	3.97	99	2	50	60-130
Pyrene	4.00	4.28	107	13	50	60-130
Benzo(a)anthracene	4.00	4.08	102	7	50	60-130
Chrysene	4.00	4.09	102	7	50	60-130
Benzo(b)fluoranthene	4.00	4.11	103	1	50	60-130
Benzo(k)fluoranthene	4.00	3.96	99	4	50	60-130
Benzo(a)pyrene	4.00	3.85	96	7	50	60-130
Indeno(1,2,3-cd)pyrene	4.00	3.50	88	1	50	60-130
Dibenz(a,h)anthracene	4.00	3.38	85	1	50	60-130
Benzo(g,h,i)perylene	4.00	3.65	91	3	50	60-130

ɔCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

trument ID: hpl

Date/Time Analyzed: 01-JUL-96 14:19

LAL Batch ID: 070196-8270-L

		IS1 Area	RT	IS2 Area	RT	IS3 Area	RT
12 HOUR STD		731006	6.337	2594017	7.772	1225867	10.433
UPPER LIMIT		1462012	6.837	5188034	8.272	2451734	10.933
LOWER LIMIT		365503	5.837	1297009	7.272	612934	9.933
Client Sample ID	LAL Sample ID						
ethod Blank	38524MB	725297	6.341	2376461	7.780	1211976	10.441
ab Ctrl Sample	38524LCS	769615	6.341	2634848	7.780	1284565	10.441
lb Ctrl Sample Dup	38524LCSDUP	710284	6.341	2506340	7.780	1294759	10.441
3S-001	L7312-25	696567	6.341	2259206	7.780	1053122	10.441
-76	L7312-29	836415	6.337	2492375	7.772	1477675	10.441
-65	L7312-30	883687	6.337	2780782	7.772	1380353	10.441
-D2	L7312-31	1046994	6.337	3121954	7.772	1629028	10.442
-R08	L7312-32	777976	6.337	2393742	7.772	1205453	10.433

'A UPPER LIMIT = +100% of internal standard area
:A LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS1 = 1,4-DICHLOROBENZENE-D4
IS2 = NAPHTHALENE-D8
IS3 = ACENAPHTHENE-D10

)CKHEED ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

trument ID: hpl

Date/Time Analyzed: 01-JUL-96 14:19
LAL Batch ID: 070196-8270-L

		IS4 Area	RT	IS5 Area	RT	IS6 Area	RT
12 HOUR STD		1307232	13.154	712183	18.409	820906	21.110
UPPER LIMIT		2614464	13.654	1424366	18.909	1641812	21.610
LOWER LIMIT		653616	12.654	356092	17.909	410453	20.610
Client Sample ID	LAL Sample ID						
ethod Blank	38524MB	1519080	13.154	885061	18.409	983187	21.110
ab Ctrl Sample	38524LCS	1592087	13.154	1026910	18.409	1018936	21.110
ab Ctrl Sample Dup	38524LCSDUP	1690605	13.154	1049236	18.409	1102355	21.110
BS-001	L7312-25	1286789	13.154	797797	18.409	857996	21.110
-76	L7312-29	1740942	13.154	1002309	18.409	1062775	21.110
-65	L7312-30	1692845	13.154	966670	18.409	1122199	21.110
-D2	L7312-31	1835687	13.154	1044325	18.409	1051486	21.110
-R08	L7312-32	1612860	13.154	874058	18.402	950920	21.103

EA UPPER LIMIT = +100% of internal standard area
EA LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS4 = PHENANTHRENE-D10
IS5 = CHRYSENE-D12
IS6 = PERYLENE-D12

OCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

strument ID: hpl

Date/Time Analyzed: 02-JUL-96 08:55
LAL Batch ID: 070296-8270-L

		IS1 Area	RT	IS2 Area	RT	IS3 Area	RT
12 HOUR STD		598283	6.332	2100365	7.772	984387	10.433
UPPER LIMIT		1196566	6.832	4200730	8.272	1968774	10.933
LOWER LIMIT		299142	5.832	1050183	7.272	492194	9.933
Client Sample ID	LAL Sample ID						
ethod Blank	38459MB	409268	6.337	1462740	7.772	736637	10.433
ab Ctrl Sample	38459LCS	690482	6.337	2290730	7.772	1123666	10.433
-76	L7312-29	785025	6.337	2291864	7.772	1147002	10.433
-R36	L7305-90	707481	6.337	2028347	7.772	961953	10.433
-R04	38459MS	751971	6.337	2184569	7.772	1040534	10.433
-R04	38459MSD	791560	6.337	2318068	7.772	1117442	10.433
ab Ctrl Sample Dup	38524LCSDUP	816248	6.337	2663065	7.772	1311601	10.441
-58	L7305-68	739546	6.337	2327573	7.772	1081328	10.441
-62	L7305-70	741805	6.341	2242033	7.780	1031619	10.441
-R37	L7305-72	728517	6.341	2218668	7.780	1130779	10.441
-64	L7305-74	892218	6.341	2621237	7.780	1251596	10.441
-54	L7305-76	834383	6.341	2478268	7.780	1132567	10.441
-48	L7305-80	680905	6.341	2033609	7.780	923449	10.441
-R04	L7305-86	751213	6.341	2199860	7.780	1039830	10.441

A UPPER LIMIT = +100% of internal standard area
A LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS1 = 1,4-DICHLOROBENZENE-D4
IS2 = NAPHTHALENE-D8
IS3 = ACENAPHTHENE-D10

OCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD

AREA AND RT SUMMARY

strument ID: hpl

Date/Time Analyzed: 02-JUL-96 08:55

LAL Batch ID: 070296-8270-L

		IS1 Area	RT	IS2 Area	RT	IS3 Area	RT
12 HOUR STD		598283	6.332	2100365	7.772	984387	10.433
UPPER LIMIT		1196566	6.832	4200730	8.272	1968774	10.933
LOWER LIMIT		299142	5.832	1050183	7.272	492194	9.933
Client Sample ID	LAL Sample ID						
6-56	L7305-66	674196	6.341	2062026	7.780	984917	10.441
4-61	L7305-101	768256	6.341	2375199	7.780	1135939	10.441
3-67	L7305-99	758270	6.341	2454001	7.780	1295564	10.441
8-D1	L7305-94	620168	6.341	1862771	7.780	964909	10.441

EA UPPER LIMIT = +100% of internal standard area
EA LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS1 = 1,4-DICHLOROBENZENE-D4
IS2 = NAPHTHALENE-D8
IS3 = ACENAPHTHENE-D10

OCKHEED ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD
AREA AND RT SUMMARY

strument ID: hpl

Date/Time Analyzed: 02-JUL-96 08:55
LAL Batch ID: 070296-8270-L

		IS4 Area	RT	IS5 Area	RT	IS6 Area	RT
12 HOUR STD		1066456	13.146	623739	18.402	696477	21.103
UPPER LIMIT		2132912	13.646	1247478	18.902	1392954	21.603
LOWER LIMIT		533228	12.646	311870	17.902	348239	20.603
Client Sample ID	LAL Sample ID						
ethod Blank	38459MB	950242	13.145	632189	18.401	714589	21.103
ab Ctrl Sample	38459LCS	1392039	13.154	936494	18.402	990129	21.103
1-76	L7312-29	1328764	13.154	777700	18.402	800715	21.103
5-R36	L7305-90	1190936	13.154	746463	18.401	791978	21.103
5-R04	38459MS	1250730	13.154	756160	18.402	776607	21.103
5-R04	38459MSD	1359543	13.154	761098	18.402	775567	21.103
ab Ctrl Sample Dup	38524LCSDUP	1586393	13.154	861366	18.402	900096	21.103
5-58	L7305-68	1333146	13.154	755871	18.402	808414	21.110
3-62	L7305-70	1295778	13.154	733285	18.409	746477	21.110
5-R37	L7305-72	1542738	13.154	809085	18.409	820056	21.110
2-64	L7305-74	1540363	13.154	831625	18.409	870453	21.110
7-54	L7305-76	1363376	13.154	699831	18.409	722357	21.110
3-48	L7305-80	1188894	13.154	772119	18.409	855033	21.110
5-R04	L7305-86	1269727	13.154	708108	18.409	729116	21.110

EA UPPER LIMIT = +100% of internal standard area
EA LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS4 = PHENANTHRENE-D10
IS5 = CHRYSENE-D12
IS6 = PERYLENE-D12

)CKHEED ANALYTICAL SERVICES

SEMI-VOLATILE INTERNAL STANDARD

AREA AND RT SUMMARY

trument ID: hp1

Date/Time Analyzed: 02-JUL-96 08:55

LAL Batch ID: 070296-8270-L

		IS4 Area	RT	IS5 Area	RT	IS6 Area	RT
12 HOUR STD		1066456	13.146	623739	18.402	696477	21.103
UPPER LIMIT		2132912	13.646	1247478	18.902	1392954	21.603
LOWER LIMIT		533228	12.646	311870	17.902	348239	20.603
Client Sample ID	LAL Sample ID						
-56	L7305-66	1235964	13.154	684612	18.409	682551	21.110
-61	L7305-101	1287972	13.154	612028	18.409	642260	21.110
-67	L7305-99	1633890	13.154	837292	18.409	882999	21.110
-D1	L7305-94	1244394	13.154	793897	18.409	826958	21.110

A UPPER LIMIT = +100% of internal standard area
A LOWER LIMIT = -50% of internal standard area
UPPER LIMIT = +0.50 minutes of internal standard RT
LOWER LIMIT = -0.50 minutes of internal standard RT

IS4 = PHENANTHRENE-D10
IS5 = CHRYSENE-D12
IS6 = PERYLENE-D12

RUN LOGS/EXTRACTION SHEETS

CKHEED ANALYTICAL LAB REVIEWED BY _____ INSTRUMENT ID # GCMS/L PAGE # 00005

A-ST	DATE	G	LAL #	DESCRIPTION/CLIENT	SOL #	MATRIX/DIL	DATA FILE	BATCH ID	METHOD FILE	TAPE #	DR	COMMENTS
	6/21	0821		50ng DFTPP	0339-32-7		So1010001	1jun2196	L8270dft1.m	L79	DMR	
	6/25	1038		50ng DPTPP	0359-32-7		So101001	1jun2596	L390dftpp		OK	
		1049		Mix B 50/100 ng/ml Pest Std	0339-39-5		So201002				DMR	Pesticide Confirmation too dilute
		1121		Mix A 50/100 ng/ml Pest STD			So301003				DMR	
		1154	L6801-7DL			Soi 1:5000	So401004				DMR	
		1228	L6774-1DL			1:5000	So501005				DMR	
		1301	L6742-5TDL			1:5000	So601006				DMR	
		1335	L6801-7DL			1:10	So701007				Rep	Data given to J Landers 6/26/96 ap
		1426	L6774-1DL			1:10	So801008				Rep	
		1455	L6742-5TDL			1:10	So901009				Rep	
	7/1/96	1038		SSTD 10.0			So1101001	1jul0196	L8270tcfp	Unit Failed	DMR	RT window Check
		1155		SSTD 0.5			So1201002		L8270sim		DMR	
		1401		DFTPP SO	0339-32-7		So1301003		L8270dfft			Pass 8270
		1419		SSTD 1.0	0339-35-3 0339-36-1		1401004		L8270sim			
		1445		SSTD 5.0	0339-35-5		1501005					8270 PAH SIM Calib
		1520		SSTD 2.0	0339-35-4		1601006					
		1555		SSTD 0.5	0339-35-2		1701007					
		1631		SSTD 0.05	0339-36-2		1801008				DMR	
		1731		SSTD 10.0	0339-35-6		1901009					
		1758		SSTD 0.05	0339-36-2		1a01010				DMR	
		1832	38524mb			H2O	1b01011					
		1907	38524cb				1c01012					
		1942	38524cbmb				1d01013					
		2017	17312-28				1e01014					
		2052	17312-29				1f01015					Acids 1:2 dil
		2128	17312-30				1g01016					
		2202	17312-31				1h01017					
		2238	17312-32				1i01018					
	7/2/96	0845		DFTPP SO	0339-32-7		So1401001	1jul0296	L8270dfft			Acs
		0855		SSTD 1.0	0339-35-3 0339-36-1		So1501002		L8270sim			Acs
		0931	38459mb			H2O	So1601003					

INSTRUMENT L & K

LOCKHEE NALYTICAL LAB REVIEWED BY ______ INSTRUMENT ID # GCMSL PAGE # 00(

ANALYST	DATE	TIME OF INJ.	LAL #	DESCRIPTION/CLIENT	SOL #	MATRIX/DIL	DATA FILE	BATCH ID	METHOD FILE	TAPE #	DR	COMMENTS
AU	7/2/96	1000	38459MB RE		0339-36-1	H2O	S04010004	Jul0296	L8270sim		DWR	
		1034	38459LCS				S05010005					
		1110	L7312-29			1:2	S06010006					
		1145	L7305-90				S07010007					
		1220	38459MS				S08010008					
		1255	38459MSD				S09010009					
		1330	38524LCSDUP				S10010010					
		1405	L7305-68				S11010011					
		1441	L7305-70				S12010012					
		1516	L7305-72				S13010013					
		1551	L7305-74				S14010014					
		1626	L7305-76				S15010015					
		1702	L7305-80				S16010016					
		1737	L7305-86				S17010017					
		1813	L7305-66				S18010018					
		1848	L7305-101				S19010019					
		1923	L7305-97				S20010020					
		1958	L7305-94				S21010021					
				Hexane			S22010022				DWR	
				MeCl2			S23010023				DWR	
AU	7/03	0833		8270 DFTPP SD	0339-30-7		S01010001	Jul0396	L8270dft			Pass
		0842		PAH SSTD 1.0	0339-35-3 0339-38-1		S02010002		L8270sim			Pass
		0926	38459MB RE			H2O	S03010003					
		0952	L7305-82				S04010004					
		1027	L7305-96				S05010005					
		1102	L7305-78				S06010006					
		1138	L7305-98				S07010007					
		1212	L7305-92				S08010008					
		1247	L7305-84			1:2	S09010009					
		1323		MeCl2			S10010010					
		1358	38459LCS RE				S11010011					

LOCKHEED ANAL. .AL SERVICES

TRACKING SHEET DATA REPORT (bs16 PAH)

EXTRACTION SHEET FOR: 8270 SIM Extraction

WORKSHEET NUMBER: 8270 SIM_38524

Continuous

HT=01/01
DUE 0405

. #	QC TYPE	CLIENT ID	DATE COLLECTED	DATE RECEIVED/ CREATED	VOL ANT EXTR 6-28-96	WATER SAMPLE pH	SURR ML	MS ML	BROUGHT TO FINAL VOLUME OF 6-30-96	AMT GIVEN TO ANALYST
512-25		EBS-001	24-JUN-96	25-JUN-96	950ml	7	1.0ml		1.0ml	1.0ml
512-29		C4-76	24-JUN-96	25-JUN-96	990ml	7				
512-30		C3-65	24-JUN-96	25-JUN-96	990ml	7				
512-31		B8-D2	24-JUN-96	25-JUN-96	930ml	7				
512-32		B5-R08	24-JUN-96	25-JUN-96	990ml	7				
524MB	MB	Method Blank		28-JUN-96	1000ml	7				
524LCS	LCS	Lab Ctrl Sample		28-JUN-96	1000ml	7		1.0		
524LCSDUP	LCSD	Lab Ctrl Sample Dup		28-JUN-96	1000ml	7		1.0		
~~IKELOT38524~~	~~SPIKELOT~~	~~Spike Lot Sample~~		28-JUN-96						

HLB 06-28-96

E STARTED: 6/28/96 DATE COMPLETED: 6/30/96 SIGNED:

TINUOUS DATE & TIME STARTED: 6/28/96 @ 9:30pm LH DATE & TIME COMPLETED: 6/29/96 @ 3:15pm LH SIGNED:

BATCH# : 8270 SIM_38524 LOT #'S SPIKE WITNESS: (none available)

R ID # : 0859-35-1 CONC: 4.0 ug/ml MECL2: 36073 NA2SO4 : K05649

ID # : 0859-35-2 CONC: 4.0 ug/ml ACN : N/A ACETONE: N/A

RATIVE EXTRACT COC: RECIEVED BY: DATE: ~~7-9-96~~

REVIEWED BY: Judith L Burns 07-01

Page 1

E.L. Pacific

Environmental Laboratory of the Pacific
930 Mapunapuna Street, Suite 100
Honolulu, Hawaii 96819
Phone: 808•831-3090 Fax: 808•831-3098

Laboratory Report

Dames & Moore	Client Project ID:	Diss. Phase Invest./Chevon HI Ref.	Sampled: Jun 20, 1996
1050 Queen St., Suite 204	Sample Descript:	Water	Received: Jun 20, 1996
Honolulu, HI 96814	Analysis Method:	Ferrous Iron, EPA 6010	Analyzed: Jun 21, 1996
Attention: Ed Tschupp	Work Order #:	9606153	Reported: Jul 5, 1996

LABORATORY ANALYSIS FOR: Ferrous Iron, EPA 6010

Sample Number	Sample Description	Detection Limit (mg/L)	Sample Result (mg/L)
696-0518	C7-54	0.1	N.D.
696-0519	D7-51	0.1	N.D.
696-0520	D8-50	0.1	N.D.
696-0521	D8-48	0.1	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

E. L. PACIFIC

Sheila Grace
Project Manager

E.L.Pacific

Laboratory Report

Environmental Laboratory of the Pacific
930 Mapunapuna Street, Suite 100
Honolulu, Hawaii 96819
Phone: 808•831-3090 Fax: 808•831-3098

Dames & Moore
1050 Queen St., Suite 204
Honolulu, HI 96814
Attention: Ed Tschupp

Client Project ID: Diss. Phase Invest./Chevon HI Ref.
Matrix: Water
QC Sample Group: 6960518-0521
Reported: Jul 5, 1996

QUALITY CONTROL DATA REPORT

ANALYTE	Ferrous Iron
Method:	EPA 6010
Analyst:	TKL
MS/MSD Batch#:	6960518
Date Prepared:	6/21/96
Date Analyzed:	6/21/96
Instrument I.D.#:	Trace-1
Matrix Spike % Recovery:	106
Matrix Spike Duplicate % Recovery:	105
Relative % Difference:	1
LCS Batch#:	6960518
Date Prepared:	6/21/96
Date Analyzed:	6/21/96
Instrument I.D.#:	Trace-1
LCS % Recovery:	115
% Recovery Control Limits:	80-120

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

E. L. PACIFIC

Sheila Grace
Project Manager

Job #9606153

0310

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manage

Sample Number	Depth	Time	Sample Type	Container Type	HVOCs 601/8010	BTE Only 602/8020	VOCs 624/8240	SVOCs 625/8270	TRPH 418.1	TPH 8015(M)-G	TPH 8015(M)-D	PCBs 8080	Total Pb/Cd 6010	PAHs 8100	TCLP	Ferrous Iron				FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
C7-54	–	0920	Water	250 ml poly											X	6960		518		filtered, unpres.	1	
D7-51	–	1110	↓	↓											X			519			1	
D8-50	–	1200	↓	↓											X			520		↓	1	
D8-48	–	1405	↓	↓											X			521			1	

LHS

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

Ramyssa 6/20/96 1445 Ryan Smith

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

Ryan Smith 6/20/96 1543 Aaron Leong

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY Environ. Lab of the Pacific

LABORATORY CONTACT

D&M CONTACT Ed Tschupp PHONE: 593-1116 x42

DAMES & MOORE
1050 QUEEN STREET, SUITE 204
HONOLULU, HAWAII 96814
(808) 593-1116 FAX: (808) 593-1198

LABORATORY NOTES: CR6-20-96

Report DID ~~5-7~~ 7-5-96

Lab DID 7-296

Location – 16

Containers 4-250N

Sample Temp. 1°C

JOB NO.: 16000-533-037 SHEET 1 OF 1

PROJECT Dissolved Phase Investigation

LOCATION Chevron Hawaii Refinery

COLLEC MD/APS DATE OF COLLECTION 6/2 '96

E.L. Pacific

Environmental Laboratory of the Pacific
930 Mapunapuna Street, Suite 100
Honolulu, Hawaii 96819
Phone: 808•831-3090 Fax: 808•831-3098

Laboratory Report

Dames & Moore	Client Project ID:	Diss. Phase Invest./Chevon HI Ref.	Sampled: Jun 20, 1996
1050 Queen St., Suite 204	Sample Descript:	Water	Received: Jun 20, 1996
Honolulu, HI 96814	Analysis Method:	Ferrous Iron, EPA 6010	Analyzed: Jun 21, 1996
Attention: Ed Tschupp	Work Order #:	9606154	Reported: Jul 5, 1996

LABORATORY ANALYSIS FOR: Ferrous Iron, EPA 6010

Sample Number	Sample Description	Detection Limit (mg/L)	Sample Result (mg/L)
696-0522	C6-56	0.1	N.D.
696-0523	C6-58	0.1	N.D.
696-0524	A3-62	0.1	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

E. L. PACIFIC

Sheila Grace
Project Manager

E.L. Pacific

Laboratory Report

Environmental Laboratory of the Pacific
930 Mapunapuna Street, Suite 100
Honolulu, Hawaii 96819
Phone: 808•831-3090 Fax: 808•831-3098

Dames & Moore
1050 Queen St., Suite 204
Honolulu, HI 96814
Attention: Ed Tschupp

Client Project ID: Diss. Phase Invest./Chevon HI Ref.
Matrix: Water
QC Sample Group: 6960522-0524

Reported: Jul 5, 1996

QUALITY CONTROL DATA REPORT

ANALYTE	Ferrous Iron
Method:	EPA 6010
Analyst:	TKL
MS/MSD Batch#:	6960518
Date Prepared:	6/21/96
Date Analyzed:	6/21/96
Instrument I.D.#:	Trace-1
Matrix Spike % Recovery:	106
Matrix Spike Duplicate % Recovery:	105
Relative % Difference:	1
LCS Batch#:	6960518
Date Prepared:	6/21/96
Date Analyzed:	6/21/96
Instrument I.D.#:	Trace-1
LCS % Recovery:	115
% Recovery Control Limits:	80-120

E. L. PACIFIC

Sheila Grace

Sheila Grace
Project Manager

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

Job #9736154

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: HVOCs 601/8010	BTE Only 602/8020	VOCs 624/8240	SVOCs 625/8270	TRPH 418.1	TPH 8015(M)-G	TPH 8015(M)-D	PCBs 8080	Total Pb/Cd 6010	PAHs 8100	TCLP	Ferrous Iron	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
C6-56	—	0950	Water	250 ml poly											X	6960522	filtered, unpres.	1	
C6-58	-	1100	↓	↓											X	523		1	
A3-62	-	1150	↓	↓											X	524	↓	1	

IHS

RELINQUISHED BY: (Signature) Zuji Shen DATE/TIME 6/20/96 1445 RECEIVED BY: (Signature) Ryan Smyth

RELINQUISHED BY: (Signature) Ryan Smyth DATE/TIME 6/24/96 1543 RECEIVED BY: (Signature) Aaron Leong

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY Environ. Lab. of the Pacific

LABORATORY CONTACT

D&M CONTACT Ed Tschupp PHONE: 593-1116x42

LABORATORY NOTES:

Sample Temp - 10C

Report DID: 7-5-96

Lab DID: 7-2-96

Location: 16

Containers: 3-250N

JOB NO.: 16000-533-037 SHEET 1 OF 1

PROJECT Dissolved Phase Investigation

LOCATION Chevron Hawaii Refinery

COLLECTOR Zuji Shen DATE OF COLLECTION 6/20/96

DAMES & MOORE
1050 QUEEN STREET, SUITE 204
HONOLULU, HAWAII 96814
(808) 593-1116 FAX: (808) 593-1198

E.L. Pacific

Environmental Laboratory of the Pacific
930 Mapunapuna Street, Suite 100
Honolulu, Hawaii 96819
Phone: 808•831-3090 Fax: 808•831-3098

Laboratory Report

Dames & Moore	Client Project ID: Dissolved Phase Inv	Sampled: Jun 21-24, 1996
1050 Queen St., Suite 204	Sample Descript: Water	Received: Jun 24, 1996
Honolulu, HI 96814	Analysis Method: Ferrous Iron, EPA 6010	Analyzed: Jun 26, 1996
Attention: Ed Tschupp	Work Order #: 9606171	Reported: Jul 8, 1996

LABORATORY ANALYSIS FOR: Ferrous Iron, EPA 6010

Sample Number	Sample Description	Reporting Limit (mg/L)	Sample Result (mg/L)
696-0585	D7-15	0.1	N.D.
696-0586	C3-65	0.1	N.D.
696-0587	C4-76	0.1	N.D.
696-0588	B8-D2	0.1	N.D.
696-0589	B5-R08	0.1	0.2

Analytes reported as N.D. were not present above the stated limit of detection.

E. L. PACIFIC

Sheila Grace
Project Manager

E.L. Pacific

Environmental Laboratory of the Pacific
930 Mapunapuna Street, Suite 100
Honolulu, Hawaii 96819
Phone: 808•831-3090 Fax: 808•831-3098

Laboratory Report

Dames & Moore
1050 Queen St., Suite 204
Honolulu, HI 96814
Attention: Ed Tschupp

Client Project ID: Dissolved Phase Inv
Matrix: Water
QC Sample Group: 6960585-589

Reported: Jul 8, 1996

QUALITY CONTROL DATA REPORT

ANALYTE	Ferrous Iron	Ferrous Iron (PDS)
Method:	EPA 6010	EPA 6010
Analyst:	NCP	NCP
MS/MSD Batch#:	6960550	6960550
Date Prepared:	6/25/96	6/27/96
Date Analyzed:	6/26/96	6/27/96
Instrument I.D.#:	Trace-1	Trace-1
Matrix Spike % Recovery:	237	97
Matrix Spike Duplicate % Recovery:	240	97
Relative % Difference:	1	0
LCS Batch#:	6960550	N.A.
Date Prepared:	6/25/96	N.A.
Date Analyzed:	6/26/96	N.A.
Instrument I.D.#:	Trace-1	N.A.
LCS % Recovery:	114	N.A.
% Recovery Control Limits:	80-120	80-120

E. L. PACIFIC

Sheila Grace
Project Manager

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

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LAB JOB NO. 960 71
LAB DUE DATE 7-5-96
LOCATION 16
CONTAINERS 5-250N

Chain of Custody / Analysis Request Form

Project Manager: Ed Tschupp

Company: DAMES & MOORE
Address: 1050 QUEEN ST. #204
HONOLULU, HAWAII 96814
Phone: 593-1116 FAX: 593-1198

Project I.D.
Job Name: Dissolved Phase Inv.
Job Number: 16000-533-037
P.O. Number

Sampled by (Please Print): J. DALESANDRO
# of Samples in Shipment: 5
Date of Sample Shipment: 6/24/96
Date Results Needed: ~~7-9-96~~ Reg TAT

Indicate Analysis Requested: Ferrous Iron

SAMPLE NO. / SAMPLE ID	COMP	GRAB	Matrix: Water	Soil	Sludge	Liquid	Solid	Oil	Other	Preservation Method	Sampling: Date	Time	Number of Containers	Ferrous Iron	Laboratory Number
D7-15		X	X							None	6/21/96	1515	1	X	960585
C3-65		X	X								6/24/96	0910	1	X	586
C4-76		X	X								6/24/96	1040	1	X	587
B8-D2		X	X								6/24/96	1110	1	X	588
B5-R08		X	X								6/24/96	1410	1	X	589

Released by (Signature)	Date / Time Released	Delivery Method	Received by (Signature)	Company / Agency Affiliation	Date / Time Received	Condition Noted
[signature]	1420 / 6/24/96	pick up	[signature]	Dames & Moore	1420 / 6/24/96	
[signature]	6/24/96 1440	Hand	Adam Jankovitz	ELP	6/24/96 1440	good / 6°C

Comments: filtered samples

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Laboratory Report

Dames & Moore	Client Project ID:	Dissolved Phase Inv	Sampled: Jun 21, 1996
1050 Queen St., Suite 204	Sample Descript:	Water	Received: Jun 24, 1996
Honolulu, HI 96814	Analysis Method:	Ferrous Iron, EPA 6010	Analyzed: Jun 26, 1996
Attention: Ed Tschupp	Work Order #:	9606172	Reported: Jul 8, 1996

LABORATORY ANALYSIS FOR: Ferrous Iron, EPA 6010

Sample Number	Sample Description	Reporting Limit (mg/L)	Sample Result (mg/L)
696-0590	D6-R34	0.1	0.8
696-0591	B4-61	0.1	0.6

Analytes reported as N.D. were not present above the stated limit of detection.

E. L. PACIFIC

Sheila Grace
Project Manager

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Laboratory Report

Dames & Moore
1050 Queen St., Suite 204
Honolulu, HI 96814
Attention: Ed Tschupp

Client Project ID: Dissolved Phase Inv
Matrix: Water
QC Sample Group: 6960590-591

Reported: Jul 8, 1996

QUALITY CONTROL DATA REPORT

ANALYTE	Ferrous Iron	Ferrous Iron (PDS)
Method:	EPA 6010	EPA 6010
Analyst:	NCP	NCP
MS/MSD Batch#:	6960550	6960550
Date Prepared:	6/25/96	6/27/96
Date Analyzed:	6/26/96	6/27/96
Instrument I.D.#:	Trace-1	Trace-1
Matrix Spike % Recovery:	237	97
Matrix Spike Duplicate % Recovery:	240	97
Relative % Difference:	1	0
LCS Batch#:	6960550	N.A.
Date Prepared:	6/25/96	N.A.
Date Analyzed:	6/26/96	N.A.
Instrument I.D.#:	Trace-1	N.A.
LCS % Recovery:	114	N.A.
% Recovery Control Limits:	80-120	80-120

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Sheila Grace
Project Manager

Please Note:
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LAB DUE DATE 7-5-96
LOCATION 16
CONTAINERS 2-250N

Chain of Custody / Analysis Request Form

ect Manager: Ed Tschupp
e Dames + Moore
ress 1050 Queen St. #204
Honolulu, HI 96814
e 593-1116 FAX 593-1198

Project I.D.
Job Name Dissolved Phase Inv.
Job Number 16000-633-037
P.O. Number

Sampled by (Please Print)	# of Samples in Shipment	Date of Sample Shipment	Date Results Needed
Z. Shen	2	6/24/96	Reg TAT 7-9-96

Indicate Analysis Requested: Ferrous Iron

SAMPLE NO. / SAMPLE ID	COMP	GRAB	Matrix: Water	Soil	Sludge	Liquid	Solid	Oil	Other	Preservation Method	Sampling: Date	Time	Number of Containers	Ferrous Iron	Laboratory Number
D6-R34		X	X								6/21/96	1530	1	X	6960590
B4-61		X	X								6/21/96	1750	1	X	591

Released by (Signature)	Date / Time Released	Delivery Method	Received by (Signature)	Company / Agency Affiliation	Date / Time Received	Condition Noted
	6/24/96 1430	Pickup		Dames & Moore	6/24/96 1430	
	6/24/96 1440	Hand	Aolani Jankowiak	ELP	6/24/96 1440	good / 6°C

ments: filtered samples
Aolani Jankowiak

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LAB JOB NO. 960164
LAB DUE DATE 7-3-96
LOCATION 16
CONTAINERS 5-250N

Chain of Custody / Analysis Request Form

Project Manager: ED TSCHUPP

Name	DAMES & MOORE
Address	1050 QUEEN ST. #204
	HONOLULU, HI 96814
Phone	593-1116
FAX	593-1198
Project I.D.	
Job Name	Dissolved Phase Inv.
Job Number	16000-533-037
P.O. Number	

Sampled by (Please Print)	# of Samples in Shipment	Date of Sample Shipment	Date Results Needed
Zuyi Shen	4 ~~4~~ 5	6/21/96	7-8-96

Indicate Analysis Requested: Ferrous Iron; TRT

SAMPLE NO. / SAMPLE ID	COMP	GRAB	Matrix: Water	Soil	Sludge	Liquid	Solid	Oil	Other	Preservation Method	Sampling: Date	Time	Number of Containers	Laboratory Number
C6-64		X	X							None	6/20/96	1650	1	6960547
~~C6-R34~~ C6-R37		X	X							↓	↓	1520	1	548
C6-R36		X	X							↓	6/21/96	1135	1	549
C6-RØ4		X	X							↓	6/21/96	0915	1	550
BB-D1		X	X							↓	6/21/96	1135	1	551

Released by (Signature)	Date / Time Released	Delivery Method	Received by (Signature)	Company / Agency Affiliation	Date / Time Received	Condition Noted
Zuyi Shen	6/21/96 / 1445	in coolers	Ryan J. Smyth	Dames and Moore	1445 / 6/21/96	Good; cold
Ryan J. Smyth	6/21/96 / 1517	in coolers	Aaron Leong	ELP	6/21/96 15:17	Good 16°C

Comments:

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Laboratory Report

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Phone: 808•831-3090 Fax: 808•831-3098

Dames & Moore	Client Project ID: Dissolved Phase Inv	Sampled: Jun 20-21, 1996
1050 Queen St., Suite 204	Sample Descript: Water	Received: Jun 21, 1996
Honolulu, HI 96814	Analysis Method: Ferrous Iron, EPA 6010	Analyzed: Jun 26, 1996
Attention: Ed Tschupp	Work Order #: 9606165	Reported: Jul 8, 1996

LABORATORY ANALYSIS FOR: Ferrous Iron, EPA 6010

Sample Number	Sample Description	Reporting Limit (mg/L)	Sample Result (mg/L)
696-0552	D7-33	0.1	N.D.
696-0553	D7-34	0.1	0.2
696-0554	I3-67	0.1	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

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Sheila Grace
Project Manager

E.L. Pacific

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Laboratory Report

Dames & Moore
1050 Queen St., Suite 204
Honolulu, HI 96814
Attention: Ed Tschupp

Client Project ID: Dissolved Phase Inv
Matrix: Water
QC Sample Group: 6960552-554

Reported: Jul 8, 1996

QUALITY CONTROL DATA REPORT

ANALYTE	Ferrous Iron	Ferrous Iron (PDS)
Method:	EPA 6010	EPA 6010
Analyst:	NCP	NCP
MS/MSD Batch#:	6960550	6960550
Date Prepared:	6/25/96	6/27/96
Date Analyzed:	6/26/96	6/27/96
Instrument I.D.#:	Trace-1	Trace-1
Matrix Spike % Recovery:	237	97
Matrix Spike Duplicate % Recovery:	240	97
Relative % Difference:	1	0
LCS Batch#:	6960550	N.A.
Date Prepared:	6/25/96	N.A.
Date Analyzed:	6/26/96	N.A.
Instrument I.D.#:	Trace-1	N.A.
LCS % Recovery:	114	N.A.
% Recovery Control Limits:	80-120	80-120

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Sheila Grace
Project Manager

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LAB DUE DATE 7-3-96
LOCATION 16
CONTAINERS 3 -250N

Chain of Custody / Analysis Request Form

Project Manager: ED TSCHUPP

Name: DAMES + MOORE
Address: 1050 QUEEN ST #204
HONOLULU HI 96814
Phone: 593-1116 FAX 593-1198

Project I.D.
Job Name: Dissolved Phase Inv
Job Number: 16000-533-037
P.O. Number:

Sampled by (Please Print): M. DALESSANDRO
# of Samples in Shipment: 3
Date of Sample Shipment: 6/21/96
Date Results Needed: 7-8-96

Indicate Analysis Requested: Furnous Ivor

SAMPLE NO. / SAMPLE ID	COMP	GRAB	Matrix: Water	Soil	Sludge	Liquid	Solid	Oil	Other	Preservation Method	Sampling Date	Sampling Time	Number of Containers	Furnous Ivor	Laboratory Number
D7-33		X	X							None	6/20/96	1325	1	X	6960552
D7-34		X	X							None	6/21/96	1220	1	X	553
I3-67		X	X							None	6/21/96	1030	1	X	554

Released by (Signature)	Date / Time Released	Delivery Method	Received by (Signature)	Company / Agency Affiliation	Date / Time Received	Condition Noted
M. Dalessandro	6/21/96 / 1445	in cooler	Ryan J Smyth	Dames and Moore	6/21/96 / 1445	Good, cold.
Ryan J Smyth	6/21/96 / 1517	in cooler	Aaron Leong	ELP	6/21/96 15:17	GOOD / 16°C

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Laboratory Report

Dames & Moore	Client Project ID: Dissolved Phase Inv	Sampled: Jun 20-21, 1996
1050 Queen St., Suite 204	Sample Descript: Water	Received: Jun 21, 1996
Honolulu, HI 96814	Analysis Method: Ferrous Iron, EPA 6010	Analyzed: Jun 26, 1996
Attention: Ed Tschupp	Work Order #: 9606164	Reported: Jul 8, 1996

LABORATORY ANALYSIS FOR: Ferrous Iron, EPA 6010

Sample Number	Sample Description	Reporting Limit (mg/L)	Sample Result (mg/L)
696-0547	C2-64	0.1	0.5
696-0548	C6-R37	0.1	0.7
696-0549	C6-R36	0.1	1.4
696-0550	C6-R04	0.1	N.D.
696-0551	B8-D1	0.1	1.3

Analytes reported as N.D. were not present above the stated limit of detection.

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Project Manager

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Laboratory Report

Dames & Moore
1050 Queen St., Suite 204
Honolulu, HI 96814
Attention: Ed Tschupp

Client Project ID: Dissolved Phase Inv
Matrix: Water
QC Sample Group: 6960547-551

Reported: Jul 8, 1996

QUALITY CONTROL DATA REPORT

ANALYTE	Ferrous Iron	Ferrous Iron (PDS)
Method:	EPA 6010	EPA 6010
Analyst:	NCP	NCP
MS/MSD Batch#:	6960550	6960550
Date Prepared:	6/25/96	6/27/96
Date Analyzed:	6/26/96	6/27/96
Instrument I.D.#:	Trace-1	Trace-1
Matrix Spike % Recovery:	237	97
Matrix Spike Duplicate % Recovery:	240	97
Relative % Difference:	1	0
LCS Batch#:	6960550	N.A.
Date Prepared:	6/25/96	N.A.
Date Analyzed:	6/26/96	N.A.
Instrument I.D.#:	Trace-1	N.A.
LCS % Recovery:	114	N.A.
% Recovery Control Limits:	80-120	80-120

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Sheila Grace

Sheila Grace
Project Manager

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APPENDIX D

APPENDIX D
REFINED CONCEPTUAL SITE MODEL, BACKYARDS AREA

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TABLES

FIGURES

Refined Conceptual Site Model for the Backyards Area
Kapolei, Oahu, Hawaii

LIST OF ACRONYMS AND ABBREVIATIONS

ATSDR	Agency for Toxic Substance Disease Registry
AWQC	ambient water quality criteria
BCF	bioconcentration factor
BTEX	benzene, toluene, ethylbenzene, and xylene
COPC	chemical of potential concern
CSM	conceptual site model
DEHP	bis 2-ethylhexyl phthalate
EPA	Environmental Protection Agency
ETs	Ecotox thresholds
HDOH	Hawaii Department of Health
HH	human health
HMW	high molecular weight
kg	kilogram
LNAPL	light non-aqueous phase liquid
LMW	low molecular weight
MEK	methyl ethyl ketone
mg/kg	milligram per kilogram
mg/L	milligram per liter
ND	not detected
NA	not analyzed
PAHs	polynuclear aromatic hydrocarbons
PRG	preliminary remediation goal
RAMR	risk assessment methodology report
RBCA	risk-based corrective action
RBSLs	risk-based screening levels
RFA	RCRA Facilities Assessment
RFI	RCRA Facilities Investigation
SWMUs	solid waste management units
USFWS	U.S. Fish and Wildlife Service

EXECUTIVE SUMMARY

This refined Conceptual Site Model (CSM) was prepared to evaluate the potential human and ecological health risks associated with 1) the light nonaqueous phase liquids (LNAPL) plume; 2) the associated dissolved phase components in groundwater and 3) chemically-impacted soils which occur on the Backyards Area located on the Chevron Hawaii Refinery (Refinery) in Kapolei, Oahu, Hawaii (Figure D-1). The results of the refined CSM indicate that current and future on-site workers could potentially be exposed to volatile chemicals released from the LNAPL into indoor air, and further analysis is recommended. No ecological health threats from the hydrocarbon plume were identified. The objective of this refined CSM is to identify the chemicals of potential concern for each environmental medium, evaluate whether complete routes of exposure exist and qualitatively evaluate the potential risks posed by the chemicals of potential concern (COPCs) in the Backyards Area (Figure D-2). Any potential risks identified in the refined CSM could be addressed in future reports by evaluating potential corrective measures and/or by completion of a Tier II risk evaluation as described in the Risk Assessment Methodology Report (RAMR) for the site (Dames & Moore, 1996a).

The three main elements of the refined CSM are identification of the following:

- Sources, types of contamination, and COPCs, including a discussion of environmental fate and transport;
- Potential human and ecological receptors; and
- Potentially complete pathways of exposure.

More specifically, this refined CSM describes the site and its environs to provide background on the contaminants present, their routes of migration, their potential impacts on human and ecological receptors in the Backyards Area of the Refinery and to provide a basis for recommendations for further work, as appropriate.

The primary source of contamination considered in this assessment was the LNAPL plume which underlies the Backyards Area (Figure D-3). Other potential sources and types of contamination were identified as the former washwater and vessel sludge from the amine wash water column, stormwater runoff (North and South Ocean Ponds), former disposal of lime blowdown solids and spent jet filter clays, former empty lubricating oil and chemical drums, former weak and strong acid neutralization sumps, former spent clay disposal, former methyl ethyl ketone (MEK) and paint disposal pits.

The analytical data taken in support of this dissolved phase investigation were used to identify COPCs for human and ecological receptors. Dissolved phase groundwater and LNAPL COPCs were independently selected for human and ecological receptors based upon comparison to media-specific and receptor-specific risk-based screening levels (RBSLs). For the migration to the ocean pathway for human recreational users and organisms in the ocean under current conditions, COPCs were selected from data from wells at the perimeter of the Refinery near the ocean. Future worst case conditions, under the health-protective assumption that the LNAPL and dissolved phase groundwater were to migrate to the ocean without any dilution or attenuation, were represented by selecting the maximum detected chemical level for any well.

In addition, the analytical data for soils from the RCRA investigation were previously evaluated against Hawaii Department of Health (HDOH) criteria (ESE, 1993). Based on that analysis, no further action was recommended for any of the solid waste management units (SWMUs) with the exception of the North and South Ocean Ponds (SWMUs 2 and 17) (Figures D-2 and D-5). Although COPCs may also be associated with the subsurface soils in the capillary fringe zone in the plume area of the Backyards Area and in near surface soils in the netted areas of the North and South Ocean Ponds, direct contact pathways for subsurface soil for current and future on-site and off-site workers are incomplete and the relative contribution of volatile COPCs in soils relative to the volatile COPCs in LNAPL is considered minimal.

The COPCs for human and ecological receptors for each environmental medium are summarized in the following table:

Dissolved Phase Groundwater COPCs		Soil COPCs		LNAPL COPCs	
Human	**Ecological**	**Human**	**Ecological**	**Human**	**Ecological**
Benzo(a)anthracene	Benz(a)anthracene	Ethylbenzene	Ethylbenzene	Benzene*	Ethylbenzene
Benzo(a)pyrene	Benzo(a)pyrene	Methylnaphthalene	Methylnaphthalene	Ethylbenzene	Toluene
Benzo(b)fluoranthene	Benzo(b)fluoranthene	Phenanthrene	Phenanthrene	Toluene	Xylenes
Benzo(g,h,i)perylene	Benzo(g,h,i)perylene	Chromium	Chromium	Xylenes	Chrysene
Chrysene	Chrysene	Nickel	Nickel	Chrysene	Pyrene
Dibenz(a,h)anthracene	Dibenz(a,h)-anthracene	Organic lead	Organic lead	Pyrene	1-Methylnaphthalene
Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene			1-Methylnaphthalene	2-Methylnaphthalene
Naphthalene	Fluorene			2-Methylnaphthalene	Acenaphthene
Bis (2-	Phenanthrene			Acenaphthene	Fluorene
ethylhexyl)phthalate	Pyrene			Fluorene	Naphthalene
Arsenic	Bis (2-ethylhexyl) phthalate			Naphthalene	Phenanthrene
Chromium	Arsenic			Phenanthrene	Arsenic
Lead	Chromium			Arsenic	Chromium
Mercury	Lead			Chromium	Copper
	Mercury			Copper	Vanadium
	Nickel			Vanadium	Zinc
	Vanadium				

*Not detected; detection limit exceed the risk-based screening level (RBSL).

Under current site conditions, the human receptors potentially exposed to site contaminants were on-site workers, off-site workers and recreational users of the Pacific Ocean. Under future conditions, assuming an industrial building is developed on the plume-impacted area of the Backyards Area, construction workers and future on-site and off-workers could potentially be exposed to COPCs. The primary ecological receptors potentially exposed to site contaminants under current and future site conditions are various species of birds, the mongoose (a mammal) and aquatic organisms in the Pacific Ocean.

Under current conditions, inhalation of volatile COPCs associated with LNAPL and saturated soils (SWMUs 9, 2, 17) is a potentially complete pathway of exposure for on-site and off-site workers. Off-site workers at a nearby chemical company are not located in the predominant downwind direction and are not expected to be significantly exposed to volatilized contaminants due to the dispersion of vapors in outdoor air. Likewise, on-site workers are not expected to be significantly

exposed to volatilized contaminants in ambient outdoor air, as compared to the potentially complete and significant exposures in indoor air in the warehouse. On-site workers in the warehouse load and unload materials through the open cargo bays of the building. Potential risks associated with indoor air exposures will be addressed in a separate report for the on-site industrial worker. The inhalation route of exposure is considered insignificant for terrestrial birds and mammals migrating across the site given the mobility of the receptors and the limited duration of exposure. The monitoring data and visual observations from this and other investigations (Dames & Moore, 1995a) indicate the LNAPL has not migrated to the Pacific Ocean. Based on the results of this dissolved phase investigation, organic constituents in groundwater attenuate rapidly in a downgradient direction and are not expected to adversely impact recreational users or aquatic organisms in the ocean. The arsenic and mercury levels in wells nearest the ocean exceeded the groundwater RBSLs that were derived from AWQC for the protection of human health from ingestion of aquatic organisms; however, both the arsenic and mercury levels observed in the wells near the ocean are generally comparable to naturally occurring background concentrations of these inorganics in seawater.

Under future conditions, assuming an industrial building is located over the plume on the Backyards Area, inhalation of indoor air is a potentially complete exposure pathway for future workers. Future off-site workers are not expected to be significantly exposed to volatilized contaminants due to the dispersion of vapors in outdoor air. Potentially complete pathways of exposure identified for future construction workers at the Backyards Area include: dermal contact with groundwater and LNAPL, inhalation of outdoor air, incidental ingestion of soil, dermal contact with soil, and inhalation of soil particulates. Because institutional controls (e.g., health and safety plans) are available to address potential exposures to construction workers, further analysis to evaluate health risks is not recommended at this time.

Although conceptually, there may be the potential for COPCs to migrate at some point in the future to the Pacific Ocean via transport with groundwater flow, the potential for migration of LNAPL to the Ocean is considered to be low because of the flat regional groundwater gradient, high residual water saturation in the vadose zone, the limited volume of LNAPL present, and the on-going plume stability evaluation program.

The following table summarizes the results of this refined CSM:

Receptor	Type of COPCs	Pathway	Risk	Action
Current Conditions				
On-site Indoor Worker	**Groundwater-** Semivolatile, Nonvolatile **LNAPL** -Volatile,	Inhalation	Potential exposure to chemicals in groundwater and LNAPL	Tier II On-site Industrial Worker Risk Assessment (in
Off-site Worker	Semivolatile, Nonvolatile	Inhalation	Insignificant exposure	progress) None
Recreational User	**Soil** - Volatile, Semivolatile, Nonvolatile	Dermal, Ingestion	Insignificant exposure	None
Organisms in Ocean; Pelagic Birds and Shore Birds		Uptake	Insignificant exposure	None
Terrestrial Birds and Mammals		Inhalation	Insignificant exposure	None
Future Conditions				
On-site Indoor Worker	**Groundwater-** Semivolatile, Nonvolatile **LNAPL** -Volatile, Semivolatile, Nonvolatile **Soil** -	Inhalation	Potential exposure to chemicals in groundwater and LNAPL	Tier II On-site Industrial Worker Risk Assessment (in progress
Off-site Worker	Volatile, Semivolatile, Nonvolatile	Inhalation	Insignificant exposure	None
Construction Worker		Inhalation, Dermal, Ingestion	Potential exposure to chemicals in groundwater and LNAPL	Institutional Controls
Recreational User		Dermal Ingestion	Potentially significant exposure, contingent upon plume migration	Plume Stabillity Evaluation Program
Organisms in Ocean; Pelagic Birds and Shore Birds		Uptake	Potentially significant exposure, contingent upon plume migration	Plume Stabillity Evaluation Program
Terrestrial Birds and Mammals		Inhalation	Potentially significant exposure, contingent upon plume migration	Plume Stabillity Evaluation Program

In summary, under current conditions, none of the dissolved phase groundwater COPCs except arsenic and mercury were found in sufficient concentration in the wells located nearest to the Pacific Ocean to pose a potential human health threat to recreational users of the ocean. Arsenic and mercury levels exceeded their respective RBSLs that were derived from AWQC based on fish

consumption. However, the arsenic and mercury levels were considered within range of naturally occurring levels in seawater. The monitoring data and visual observations indicate the LNAPL has not migrated to the Pacific Ocean. The LNAPL is unlikely to migrate to the ocean in the future due to the flat groundwater gradient and monitoring observations that the plume is stable. Current and future on-site workers could potentially be exposed to volatile chemicals released from the LNAPL into indoor air. These exposures will be addressed in a separate report which evaluates an industrial worker scenario using a worst-case indoor air scenario for buildings at the Refinery. There are no identified ecological health threats from the hydrocarbon plume.

D.1 INTRODUCTION

This refined Conceptual Site Model (CSM) was prepared to evaluate the potential human and ecological health risks associated with chemicals identified in light non aqueous phase liquids (LNAPL), dissolved phase groundwater, and chemically impacted soils in the Backyards Area of the Chevron Hawaii Refinery (Refinery) in Kapolei, Oahu, Hawaii (Figure D-1). A preliminary CSM was initially prepared as part of the Risk Assessment Methodology Report (RAMR) (Dames & Moore, 1996a). The preliminary CSM was intended to identify the potentially complete exposure pathways and receptors of concern. Analytical data were then collected and this refined CSM was prepared.

The objectives of this refined CSM are to identify the chemicals of potential concern (COPCs) for each environmental medium; to evaluate whether complete routes of exposure exist; and to qualitatively evaluate the potential risks posed by the COPCs in the Backyards Area (Figure D-2). Any potential risks identified in the refined CSM could be addressed in future reports by evaluating potential corrective measures and/or by completion of a Tier II risk evaluation as described in the RAMR for the site (Dames & Moore, 1996a).

The three main elements of the refined CSM are identification of the following:

- Sources and types of contamination, including a discussion of environmental fate and transport;
- Potential human and ecological receptors; and
- Potential pathways of exposure.

More specifically, this refined CSM describes the site and its environs to provide an initial understanding of the contaminants that are present; their routes of migration; their potential impacts on human and ecological receptors; and to provide a basis for recommendations for further work, as appropriate. This refined CSM includes an evaluation of potential risks posed by the current and future site conditions in the absence of any remediation, i.e., under baseline conditions. To evaluate risk, it is necessary to understand the current distribution of chemicals at the site. Existing site monitoring data and physical site conditions (i.e., soil stratigraphy, groundwater hydrogeology, climatic conditions, local land use, etc.) are summarized in this refined CSM, along with a historical perspective on past activities at and in the proximity of the Backyards Area, in order to identify potentially impacted areas and COPCs.

D.1.1 SITE DESCRIPTION AND BACKGROUND

D.1.1.1 Site Location

The Refinery is located on an approximately 250-acre site (Dames & Moore, 1996b) within the Campbell Industrial Park at Barber's Point on the Ewa Plain of southwestern Oahu, adjacent to the Waianae Range (Figure D-1). The coastal plain in the area of the Refinery consists of an exposed, emerged coral reef, presenting a relatively flat mini-karst topography (Dames & Moore, 1995b). The Pacific Ocean bounds the western edge of the site. There are no other natural surface water bodies nearby. The Ewa Plain is hot and dry, generally receiving less than 20 inches of rain each year (Dames & Moore, 1995b). Based on the wind rose for Barber's Point (RETEC, 1990), the predominant wind direction is from the east (i.e., toward the ocean).

The Backyards Area of the Refinery is surrounded by industrial development. The primary activity is the processing of crude oil to produce motor and aviation gasoline, jet fuel, diesel fuel, fuel oil and kerosene (Dames & Moore, 1981). The Backyards Area of the Refinery is a flat, largely undeveloped area which is devoid of vegetation. It contains the North and South Ocean Ponds (Figures D-2 and D-3). The western boundary lies adjacent to the Pacific Ocean. A small warehouse is located on the northwest edge of the plume area (Figure D-2). Three other buildings (the maintenance shop and storehouse, a storehouse and a welding building) are located in the northern part of this area, but not in the plume area. There are currently approximately 34 LNAPL extraction wells on the eastern edge of the area.

The presence of LNAPL at the Refinery has been documented in several site investigations (Dames & Moore, 1982; 1995a; and 1995b). The approximate extent of the hydrocarbon plume based on existing data is presented in Figure D-3. LNAPL is currently recovered from the extraction wells in the Backyards Area. Analytical data collected for this dissolved phase investigation was used to identify the groundwater COPCs in this refined CSM. The locations of the monitoring wells in the Backyards Area are included in Figure D-4.

D.1.1.2 Topography

The topography in the site vicinity is nearly flat, with relatively little relief or development of surface water drainage features. Ground surface elevations in the site vicinity range from approximately 5 to 7 feet above Mean Sea Level (MSL). The site is situated on an emerged coral reef complex in

which numerous surface and subsurface voids have developed, described as a karst topography. Voids are not visible at the ground surface at the site.

D.1.1.3 Geology

The geology of the general site area consists of coastal plain deposits, including coral reef deposits, coralline debris, and alluvium that are built up on the flanks of the Waianae Volcano (Dames & Moore, 1996b). The coastal plain sedimentary deposits, referred to as the "caprock" due to the relatively low permeability of the lower sedimentary deposits, are approximately 600 feet thick in the vicinity of the Refinery. Low permeability (fine grained) alluvium and lagoonal deposits within the caprock formation are interbedded with, and laterally grade into, relatively highly permeable coral reef and coralline debris (sand and gravel) deposits.The shallow limestone deposits in the site vicinity have been described as part of a karst terrain, the most characteristic features of which are semi-cylindrical,near-vertically oriented soil pipes, or voids. Subsurface voids as large as 8 to 10 feet deep and 3 to 5 feet wide have been reported in the site vicinity.

D.1.1.4 Regional Hydrology

The regional hydrogeologic conditions involve two water-carrying systems: the basal aquifer in Waianae Volcanic rocks and the shallower "caprock" sedimentary aquifer system (Dames & Moore, 1996b). At the Refinery, the volcanic aquifer is estimated to be at a depth of 600 feet below ground surface (bgs). Several discrete aquifer zones (coralline aquifers) exist within the shallower sedimentary deposits. Individual aquifer zones consist of permeable coral deposits that are separated from other zones by low permeability silt and clay sediments.

Groundwater in the uppermost aquifer is not used for domestic or irrigation purposes, due to high total dissolved solids (TDS) concentrations. Groundwater is used for industrial purposes at the Refinery and elsewhere within the Campbell Industrial Park. There are also several wastewater injection wells in the vicinity. Groundwater is considered by the Hawaii Department of Health (HDOH) to be non-potable, and use of injection wells for wastewater disposal is permitted in the area through the HDOH Underground Injection Control (UIC) program.

D.1.1.5 Local Hydrology

In the Backyards Area, the depth to groundwater is reported to be between approximately 3 to 6 feet bgs. The uppermost aquifer contains a lens of "fresh" groundwater, floating on top of the denser salt water present in the lower part of the aquifer. The fresh groundwater reflects recharge from infiltration of precipitation, runoff, and irrigation return flow. In the site vicinity, available water quality and salinity profile data indicate that the fresh groundwater lens is approximately 40 feet thick, and that the groundwater is non-potable and is considered to be brackish, based on TDS concentrations. The diurnal tidal fluctuations influence the groundwater flow direction at the site. The gradient may vary from east to west depending on when groundwater levels are measured relative to tidal cycles. Over the longer term, the average gradient at the site is towards the ocean.

D.2 CONTAMINANT SOURCES AND TYPES

Contaminant sources and types were identified by reviewing the background information and available analytical data. This information was primarily obtained from the following documents:

- A.T. Kearney (1986). RCRA Facilities Assessment
- ESE. (1993) RCRA Facility Investigation at Chevron Hawaii Refinery
- Dames & Moore (1996a) Risk Assessment Methodology Report, Chevron Hawaii Refinery; and
- Dames & Moore (1982) Phase II Hydrogeologic and RCRA Permitting Study.

D.2.1 CONTAMINANT SOURCES

Various petroleum releases associated with Refinery activities have occurred in the past. The releases have resulted in LNAPL floating on the groundwater, a portion of which has migrated onto the Backyards Area. The approximate extent of the LNAPL plume based on existing data is presented in Figure D-3.

In addition to the LNAPL plume from the Refinery, activities that have historically occurred in this area include washwater and vessel sludge collection from the amine wash water column, collection of stormwater runoff (North and South Ocean Ponds), former disposal of lime blowdown solids and spent jet filter clays (Waste Pile C), storage of empty lubricating oil and chemical drums, operation

of both a weak acid and strong acid neutralization sump, spent clay disposal, methyl ethyl ketone (MEK) and paint disposal pits (ESE, 1993).

A total of 14 solid waste management units (SWMUs) were identified within the boundaries of the Backyards Area as part of a RCRA investigation (Figure D-5) (A.T. Kearney, 1986; ESE, 1993). The following SWMUs were categorized for no further action as part of the RCRA Facilities Assessment (RFA) based on no evidence of hazardous waste or releases or the intent of Chevron to close the facility upon receipt of the RCRA permit:

- Sewer Sludge Impoundment (SWMU-14);
- Induced Air Flotation (IAF) Unit (SWMU-29);
- IAF Pond (SWMU-6);
- Wastes and surrounding soils were removed in 1982 when the Inactive Clay Dewatering Impoundment (SWMU-8) was closed; and
- Landfill A (SWMU-11) received spent clays, lime blowdown and catalyst fines. The landfill was closed in 1984 and the area regraded.

The RCRA Facilities Investigation (RFI) Report addressed the following Backyards Area sources (ESE, 1993):

- The former Waste Pile "C" Area (SWMU-25)
- The former Amine Wash Water Impoundment (SWMU-9);
- The Empty Drum Storage Area (SWMU-27);
- Methyl ethyl ketone (MEK) and paint disposal pits (SWMU-37);
- Acid Neutralization Sumps near the Acid Plant (SWMUs 32 and 33);
- The North and South Ocean Ponds (SWMU-22 and 21, respectively); and
- The Clay Dewatering Basin (SWMU-35) (SWMU-37).

Based upon soil sampling data collected during the RFI investigation, no further action was recommended for the SWMUs with the exception of the North and South Ocean Ponds (Figure D-5). The North and South Ocean Ponds contained chemical concentrations in soils above HDOH Action Levels (ESE, 1993).

Besides the SWMUs, the LNAPL is a source of COPCs. LNAPL samples were collected and analyzed from two wells in the Backyards Area, but were not specifically characterized for the type

of LNAPL. However, the high ratio of low molecular weight PAHs to high molecular weight PAHs detected in LNAPL samples from the Backyards Area suggests that the LNAPL in the Backyards is comprised of light and intermediate petroleum streams.

D.2.2 CHEMICALS OF POTENTIAL CONCERN

Previous analytical data from the RCRA investigation (ESE, 1993) was considered for soils. The analytical data for dissolved phase groundwater and LNAPL collected as part of this investigation were used to develop separate lists of COPCs for human and ecological receptors. The analytical data for groundwater and LNAPL are presented in Tables D-1 and D-2, respectively. Figure D-6 presents an overview of the COPC selection process.

D.2.2.1 COPCs for Soils

The analytical data for soils from the RCRA investigation were previously evaluated against HDOH criteria (ESE, 1993). Based on this analysis, no further action was recommended for any of the SWMUs with the exception of the North and South Ocean Ponds (Figure D-5). Levels of ethylbenzene, methylnaphthalene, phenanthrene, nickel and organic lead levels in near surface soils exceeded HDOH criteria in the North Ocean Pond and levels of chromium exceeded HDOH criteria in near surface soils in the South Ocean Pond. In addition, the former Amine Wash Water Impoundment contained ethylbenzene in subsurface soils (i.e., at 3.5 feet) above HDOH criteria. Capillary fringe soils in the LNAPL plume-impacted area are reasonably expected to contain petroleum hydrocarbons.

The Refinery Spill Prevention, Control and Countermeasures (SPCC) plan requires that the drainage areas associated with stormwater discharges (i.e., Discharge 003 in the Backyards Area) are routinely inspected for oil or other contaminants on the ground and any spills are immediately cleaned up. Therefore, any potential surface soil contamination which may have occurred in the Backyards Area subsequent to the preparation of the RFI report has likely been cleaned up.

D.2.2.2 COPCs for Groundwater

Nineteen groundwater wells in the Backyards Area were sampled in June 1996 (Figure D-4). Three sets of wells that form profiles oriented along groundwater flowlines downgradient of the LNAPL plume in the Backyards Area were selected for sampling, along with a cross-gradient well (C2-64)

and an additional well (I3-67) in the northeastern portion of the Refinery (Figure D-2) selected to assist in the evaluation of background concentrations. The groundwater collected from the upgradient well of each profile, the background well, and some of the additional wells were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polynuclear aromatic hydrocarbons (PAHs), and selected metals using EPA Methods 8260, 8270, 8310, and 6000/7000, respectively. The groundwater from the remaining profile wells and one of the additional wells was analyzed for the VOCs benzene, toluene, ethylbenzene and xylenes (BTEX), PAHs, and select metals, using EPA Methods 8260, 8310, and 6000/7000, respectively.

Chemicals detected in at least one sample include: VOCs (acetone, toluene, ethylbenzene, and xylenes), PAHs (high molecular weight and low molecular weight), another SVOC (bis 2-ethylhexylphthalate), and metals (arsenic, chromium, lead, mercury, nickel, and vanadium). Carbon disulfide was detected in one sample (D8-50) at a very low concentration (1.5 microgram per liter (µg/L), less than the detection limit of 5 µg/L, but was not considered a COPC because it is not normally associated with petroleum hydrocarbons. In addition, 1,1-dichloroethane was detected in one well (C4-76 at 2.2 µg/L), but was not considered a COPC because it is not normally associated with petroleum hydrocarbons and was also detected in the cross-gradient well (C2-64) at 2.4 µg/L.

Quality Assurance Evaluation. A Level III data validation was performed on the analytical data for groundwater collected in June 1996. In accordance with the Functional Guidelines for Organics (EPA, 1988), if a blank contained detected levels of chemicals which are common laboratory contaminants and the concentrations of those chemicals in the sample were less than ten times the maximum detected blank concentrations, then the chemicals were considered "non-detect" for those samples. In addition, if the blank contains detected levels of one or more chemicals which are not considered by EPA to be common laboratory contaminants and the concentrations of those chemicals in the sample are less than five times the maximum detected blank concentrations, then the chemicals were considered "non-detect" for those samples. Acetone was requalified as a non-detect and was eliminated as a COPC on this basis.

Comparison to Human Health Groundwater Risk Based Screening Levels (RBSLs). Dissolved phase groundwater and LNAPL COPCs for humans were selected based upon comparison to human health groundwater RBSLs (Table D-3; Figure D-6). The human health groundwater RBSLs are concentrations of chemicals in groundwater which represent an acceptable health risk for human exposures. There are no RBSLs based solely on the inhalation of vapor pathway, which would be the most appropriate RBSLs for workers in the Backyards Area. In the order of preference, the

RBSLs used in the assessment are: 1) The HDOH Risk-Based Corrective Action (RBCA) Tier 1 Groundwater Action Levels for drinking water; 2) the EPA human health ambient water quality criteria (AWQC) for protection of exposure to chemicals in fish and shellfish; 3) EPA Region IX Preliminary Remediation Goals (PRGs) for residential tap water; and 4) RBSLs for surrogate chemicals of comparable structure. Each of these RBSLs is discussed below.

- **HDOH RBCA Tier 1 Groundwater Action Levels for Drinking Water**. Although groundwater at and near the Backyards Area is not used for drinking water, the HDOH RBCA Tier 1 Groundwater Action Levels for drinking water were conservatively selected as screening criteria (HDOH, 1995). These criteria were selected even though chloride concentrations in groundwater beneath the Refinery of 1,000 mg/L and total dissolved solids ranging from 3,089 to 12,748 mg/L have been reported (Dames & Moore, 1982). These conditions are not characteristic of potable water and therefore, domestic use of groundwater is not expected to occur in the future. If HDOH criteria were unavailable, the EPA human health AWQC for protection of exposure to chemicals in fish and shellfish were used.

- **EPA human health AWQC for protection of exposure to chemicals in fish and shellfish.** The human health AWQCs (EPA, 1992) are chemical concentrations in water calculated based on exposure via consumption of organisms. Because this pathway is a potentially complete exposure pathway for the dissolved phase plume under current conditions and, as discussed previously, domestic use groundwater is not expected to occur, these criteria were preferentially selected over other tap water criteria. In the absence of AWQC values, EPA Region IX PRGs for residential tap water were conservatively used for screening purposes.

- **EPA Region IX PRGs for residential tap water.** Although groundwater at and near the Backyards Area is not used for drinking water, the EPA Region IX PRGs for residential tap water (EPA, 1995) were conservatively selected as screening criteria (HDOH, 1995). These criteria were selected even though groundwater conditions are not characteristic of potable water and domestic use of groundwater is not expected to occur in the future. If none of these criteria were available for specific chemicals, the RBSLs for surrogate chemicals of comparable structure were utilized.

- **RBSLs for surrogate chemicals of comparable structure.** The RBSL for naphthalene was used as a surrogate for 1-methylnaphthalene and 2-methylnaphthalene, and the RBSL for anthracene was used as a surrogate for phenanthrene. The RBSL for acenaphthene was

used as a surrogate for acenaphthylene. The RBSL for indeno (1,2,3-cd)pyrene was used as a surrogate for benzo(g,h,i)perylene.

Table D-3 summarizes the human health RBSLs for chemicals detected in groundwater samples from the Backyards Area. Groundwater COPCs were evaluated by comparing the maximum detected chemical concentration to human health groundwater RBSLs for on-site workers. Table D-4 presents a comparison of the maximum detected concentrations for groundwater to the human health RBSLs for workers in the Backyards Area and a separate scenario using the perimeter wells (i.e., closest to the ocean) to evaluate the potential for exposure to recreational users of the ocean under current conditions. For chemicals which were not detected in any sample, groundwater COPCs were evaluated by comparing the minimum detection limit to RBSLs. If the minimum detection limit is above the appropriate risk-based screening level and that chemical is a Class A carcinogen which may reasonably be expected to be associated with petroleum hydrocarbons, then that chemical was retained as a COPC even if it was not detected in any of the samples. No non-detected dissolved phase groundwater COPCs were retained on that basis. However, benzene in LNAPL was retained because the detection limit exceeded the RBSL.

Comparison to Ecological Groundwater RBSLs. COPCs for ecological receptors were selected based upon comparison of chemical concentrations in on-site wells to ecological RBSLs (Table D-5; Figure D-6). The risk-based evaluation for COPCs in dissolved phase groundwater performed for ecological receptors was different than the approach used for human receptors. Since migration to the ocean was the only pathway of concern for ecological receptors, COPCs were identified for both current and future worst case conditions. Current conditions were represented by selecting COPCs at the perimeter of the Refinery near the ocean (Table D-6). Future worst case conditions, under the health-protective assumption that the LNAPL and dissolved phase groundwater were to migrate to the ocean without any dilution or attenuation, were represented by selecting the maximum detected chemical level for any well (Table D-6). In the order of preference, the RBSLs used in the assessment are: 1) The HDOH RBCA Tier 1 Groundwater Action Levels for non-drinking water; 2) the EPA Ecotox Thresholds (ETs) (EPA, 1996); and 3) RBSLs for surrogate chemicals of comparable structure. Each of these RBSLs is discussed below.

- **HDOH RBCA Tier 1 Groundwater Action Levels for Surface Water**. The HDOH groundwater action levels (HDOH, 1995) that are set to be protective against potential adverse impact to surface water ecosystems were preferentially selected as the groundwater RBSLs.

- **EPA Ecotox Thresholds.** Ecotox Thresholds for marine waters (EPA, 1996) which are largely based on EPA AWQC were used to evaluate potential ecological impacts in surface water if no HDOH groundwater action levels were available. Although the ecological receptors are not directly exposed to chemicals in groundwater, the use of surface water criteria applied to groundwater media conservatively ensures that if the groundwater migrates to the Pacific Ocean, the ecological receptors are protected against adverse effects. In the absence of marine criteria, freshwater criteria were considered.

- **EPA AWQC for saltwater aquatic life:** Criterion continuous or criterion maximum AWQC based on protection of saltwater species were utilized (EPA, 1992). In the absence of a saltwater criterion, a freshwater criterion was used. The continuous criterion for protection of freshwater aquatic life was used for chromium.

- **RBSLs for surrogate chemicals of comparable structure.** For chemicals without suitable aquatic toxicity data, surrogate chemicals with comparable chemical structure were utilized. The RBSL for naphthalene was used as a surrogate for 1-methylnaphthalene and 2-methylnaphthalene, and the RBSL for benzo(a)pyrene was used as a surrogate for all other high molecular weight (HMW) PAHs. The RBSL for acenaphthene was used as a surrogate for acenaphthylene.

Table D-6 presents a comparison of the maximum detected concentrations for groundwater to these ecological health RBSLs. Based on this comparison, bis-2-ethylhexylphthalate, phenanthrene, fluorene, 8 HMW PAHs, arsenic, chromium, lead, mercury, nickel and vanadium remain COPCs for ecological receptors for dissolved phase groundwater. In addition, the maximum detected concentration in wells located at the perimeter of the Refinery (i.e., closest to the ocean) were compared to ecological RBSLs (Table D-6). No COPCs were identified for ecological receptors for these wells.

Frequency of Detection. Chemicals that are infrequently detected in site samples may be artifacts in the data due to sampling, analytical, or other problems and therefore may not be related to the hydrocarbon plumes. Therefore, chemicals which are detected in less than 5% of the samples collected per medium may be eliminated as COPCs, unless they are classified as known human carcinogens (i.e., Class A) by the U.S. EPA. No COPCs were eliminated based on frequency of detection.

Background Comparison. EPA guidance states that "inorganic chemicals present at the site at naturally occurring levels may be eliminated from the quantitative risk assessment" (EPA, 1989). Chemicals which are present at levels representative of background conditions are not considered to be associated with the LNAPL plume. Therefore, chemicals in groundwater with a maximum detected value below the background level will be eliminated as COPCs. Two groundwater wells were identified as background wells: I3-67 and C2-64. For each metal detected in groundwater at the Refinery at levels above the RBSLs, at least one detect was greater than the metal level in the background well. While the occurrence of a metal detect at a level greater than the level in the background well does not necessarily imply that the detect is not representative of the range of naturally occurring levels, the small size of the data set prohibits the use of more rigorous statistical tests, such as the t-test, to evaluate if the results are representative of background conditions. Therefore, as a conservative assumption, no metals were excluded as COPCs based upon background comparison to groundwater; however, because of the proximity of the site to the Pacific Ocean, natural background levels of inorganic chemicals in seawater were considered in the evaluation of metal levels in wells near the ocean (Section D.4).

The following chemicals remain as COPCs for dissolved phase groundwater in the Backyards Area:

Dissolved Phase Groundwater COPCs			
Human			

HMW PAHs
benzo(a)anthracene;
benzo(a)pyrene;
benzo(b)fluoranthene;
benzo(g,h,i)perylene;
chrysene;
dibenz(a,h)anthracene;
indeno(1,2,3-cd)pyrene
	LMW PAHs
	naphthalene
		Other SVOCs
		bis (2-ethylhexyl)phthalate
			Metals
			arsenic
			chromium
			lead
			mercury

Ecological			
Current Conditions-None			
Future Worst-Case			

HMW PAHs
benzo(a)anthracene;
benzo(a)pyrene;
benzo(b)fluoranthene;
benzo(g,h,i)perylene;
chrysene;
dibenz(a,h)anthracene;
indeno(1,2,3-cd)pyrene
pyrene
	LMW PAHs
	fluorene
	phenanthrene
		Other SVOCs
		bis (2-ethylhexyl)phthalate
			Metals
			arsenic
			chromium
			lead
			mercury
			nickel
			vanadium

* Not detected in any sample.

The COPCs for dissolved phase groundwater are classified as SVOCs or metals. No VOCs remain as COPCs for human or ecological receptors for dissolved phase groundwater.

D.2.2.3 COPCs for LNAPL

LNAPL samples were obtained from Wells C4-66 and D7-35 in August 1996. The LNAPL samples were analyzed for VOCs, SVOCs, and selected metals by EPA Methods 8260, 8270, and 6000/7000, respectively. For purposes of screening COPCs in LNAPL, the levels of chemicals detected in the LNAPL were compared against the same groundwater RBSLs used for dissolved phase groundwater (Figure D-3). The LNAPL results in units of milligrams per kilogram (mg/kg) were converted to milligrams per liter (mg/L) assuming a free product density of 1.0 grams per cubic centimeter ($g/cm^{3)}$. The LNAPL density is likely to range between 0.7 g/cm^3 and 1.0 g/cm^3, and the assumption of the greatest density results in the highest, most conservative, estimates of chemical levels in the LNAPL. This analysis has a high level of conservatism and uncertainty. It assumes that the toxicity of the LNAPL is similar to the toxicity of the chemical dissolved in groundwater, and that the total intake from ingestion or contact with the chemical concentration in LNAPL is similar to the intake from the same chemical concentration in dissolved phase groundwater.

Based upon comparison with human and ecological groundwater RBSLs, the COPCs were the same for both human and ecological receptors with the exception of zinc which was only retained based on potential ecological concerns. The following chemicals remain as COPCs for LNAPL at the Backyards Area:

LNAPL COPCs			
HMW PAHs	***LMW PAHs***	***Metals***	***VOCs***
chrysene pyrene	1-methylnaphthalene 2-methylnaphthalene acenaphthene fluorene naphthalene phenanthrene	arsenic chromium copper vanadium zinc (ecological)	benzene (human)* ethylbenzene toluene total xylenes

* Not detected in any sample.

The chemicals with detected concentrations which were excluded as COPCs and the basis for their exclusion are presented in Table D-7. Although benzene was not detected in any sample, this

chemical was conservatively retained as a COPC for human receptors because the detection limits were greater than the groundwater RBSLs and it is a Class A carcinogen reasonably expected to be associated with some types of petroleum hydrocarbons. The COPCs for LNAPL are classified as VOCs, SVOCs (*e.g.* high and low molecular weight PAHs), and metals.

D.2.3 FATE AND TRANSPORT PROPERTIES FOR SUBSURFACE SOIL, LNAPL, AND DISSOLVED PHASE COPCS

Compounds released to the environment undergo physical and chemical processes that may alter their chemical makeup or properties. For example, sorption to soil or sediment may retard transport and effectively immobilize chemicals. Fate mechanisms for compounds may include physical/chemical transformations such as oxidation or reduction, or biodegradation. Biodegradation is the breakdown of organic compounds via biological processes occurring in the environment. Thus, contaminant fate and transport processes can either mitigate (e.g., strong sorption to sediment) or enhance (e.g., tendency to vaporize) exposure potential. The two primary fate and transport processes that are of concern at the Backyards Area: (1) volatilization from groundwater, and (2) adsorption to soil or sediment which mitigates chemical movement with groundwater flow. In regard to these fate and transport processes, each of the selected groundwater or LNAPL COPCs is discussed in sections D.2.3.1 through D.2.3.3.

D.2.3.1 SEMIVOLATILE ORGANIC COMPOUNDS

D.2.3.1.1 Polynuclear Aromatic Hydrocarbons

Eight HMW PAHs (i.e., benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene and pyrene, and three low molecular weight (LMW) PAHs (i.e., fluorene, naphthalene and phenanthrene) are dissolved phase COPCs in Backyards Area groundwater.

Two HMW PAHs (i.e., chrysene and pyrene) are COPCs in LNAPL. In addition the LMW PAHs: 1-methylnaphthalene, 2-methylnaphthalene, acenaphthene, fluorene, naphthalene, and phenanthrene were retained as COPCs in LNAPL.

Environmental fate properties of PAHs vary as a function of molecular weight. PAHs are generally classified either as low- or high- molecular weight compounds (LMW PAHs and HMW PAHs,

respectively). The LMW PAHs (*e.g.*,1-methylnaphthalene, 2-methylnaphthalene, acenaphthene, anthracene, fluorene, naphthalene, and phenanthrene) have molecular weights below 200 grams per mole (g/mole) while the HMW PAHs (*e.g.*, benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene,benzo(g,h,i)perylene,dibenz(a,h)anthracene,chrysene, indeno(1,2,3-cd) pyrene, and pyrene) have molecular weights greater than 200 g/mole.

Because of their highly organic nature and large molecular size, HMW PAH compounds are readily adsorbed to soil, and have an especially strong affinity for organically enriched substrates. In addition, HMW PAH compounds have low water solubilities and are relatively resistant to leaching from soils. For example, the solubility of benz(a)anthracene in water ranges from 0.009 to 0.014 mg/L. Therefore, the primary fate of HMW PAHs in soil is adsorption. HMW PAH compounds are resistant to biodegradation in soils, as shown by an aerobic soil half-life ranging from 1 year to 2.6 years for dibenz(a,h)anthracene (Howard, 1991).

The HMW PAHs are more readily biodegradable in surface water than in soil. Furthermore, most hydrophobic HMW PAHs (e.g., indeno(1,2,3-cd)pyrene)have a high affinity for binding to dissolved humic materials and have rapid biotransformation rates which tend to lessen or negate bioaccumulation and food chain transfer of HMW PAHs (Eisler, 1987a).

Although the general characteristics of HMW PAHs and LMW PAHS are very similar, LMW PAHs tend to demonstrate slightly more mobility, more solubility, and are more subject to degradation. The solubility of PAHs as a general rule increases with lower molecular weight species. For example, the solubility of the LMW PAH, fluorene is 1.835 mg/L. Like HMW PAHs, the LMW PAHs are slightly more subject to microbial degradation in surface water than groundwater. Although they are more easily degraded than HMW PAHs, microbial degradation in sediments and soils for LMW PAH compounds is still low, as shown by a soil half-life of 48 days for naphthalene (Howard, 1991). Because of their organic nature and relatively large molecular size, they are readily absorbed into most soils, and have an especially strong affinity for organically enriched substrates.

Bioconcentration tends to increase with the increasing molecular weight of PAHs. LMW PAHs are rapidly accumulated, however, bioconcentration and bioaccumulation is generally not significant for most species since most organisms can metabolize PAHs. However, algae, molluscs and other invertebrates metabolize PAHs much more slowly and are more likely to accumulate PAHs (Eisler, 1987a).

D.2.3.1.2 Other SVOCs (Bis(2-ethylhexyl)phthalate (DEHP))

DEHP is a COPC in dissolved phase groundwater. DEHP is a common plasticizer used in PVC (polyvinylchloride) plastics, natural and synthetic rubbers, nitrocellulose, and cellulose acetate butyrate polymers. The principal fate of the compound DEHP in the environment is adsorption to soil. Based upon an estimated organic carbon partition coefficient (K_{oc}) of 62000, DEHP undergoes moderately high adsorption to soil (DOE, 1988). DEHP has a low solubility in water (0.3 mg/L), and thus is unlikely to be transported to groundwater by leaching from soil. Due to its low Henry's law constant ($2.5x10^{-7}$ atm-m^3/mole at 20C) and very low vapor pressure (0.000006 mm Hg), volatilization from water or soil is not likely to be a major transport process. DEHP is biodegraded at a moderate rate in soil and in surface water, with a measured half-life of 2-3 weeks in water (Howard, 1989). DEHP released to water systems will strongly adsorb to sediments and has a low potential to bioaccumulate in fish (BCF = 160) (EPA, 1980).

D.2.3.2 VOLATILE ORGANIC COMPOUNDS

BTEX - Benzene, toluene, ethylbenzene, and xylenes have been retained as COPCs for LNAPL in the Backyards Area. These chemicals are common constituents of petroleum hydrocarbon materials. Xylenes consist of a single aromatic ring with two methyl substitutes, and include a blend of the three isomers, ortho-, meta-, and para-xylene, whose terms refer to the relative positions of the methyl groups. In addition to the benzene ring, toluene has one methyl group and ethylbenzene has one ethyl group.

These aromatic compounds are of moderate polarity, yielding moderate to low water solubilities (Howard, 1991). The solubility of the pure compounds decreases in the order: benzene (2.8 mg/L) > toluene (0.5 mg/L) > xylenes (0.2 mg/L) > ethylbenzene (0.15 mg/L). When BTEX is part of a mixture such as gasoline, the dissolved concentration is less. For example, typical benzene concentrations in water when a free gasoline phase is in equilibrium with water range from 0.024 to 0.11 mg/L (ASTM, 1994).

BTEX compounds are subject to rapid volatilization in near-surface soil (Howard, 1991). Henry's Law Constants range from 5.6×10^{-3} for benzene to 7.0×10^{-3} atm m^3/mole for xylenes, while vapor pressures range from 95 for benzene to 7 mmHg for ethylbenzene (Howard, 1990). BTEX has a low organic carbon partition coefficient (K_{oc}), which is a measure of a chemical's tendency to adsorb to organic carbon in soil. Based on the low K_{oc} for BTEX compounds and their moderate

solubility, BTEX releases may leach and migrate to groundwater. Individually, benzene is fairly unreactive to oxidizing agents (e.g., ferric iron, manganese oxides, and molecular oxygen); however, the substituted alkyl groups render toluene, ethylbenzene and xylenes susceptible to chemical or biological oxidation. Since these compounds are moderately soluble in water, they are subject to transport in confined aquifers where advective transport is possible, and volatilization is low. Such transport is limited by biodegradation.

BTEX compounds are not persistent and are subject to biodegradation in soil, surface water, and shallow aerobic groundwater. Published aerobic biodegradation half-lives range from 5 to 16 days for benzene, 3 to 10 days for ethylbenzene and 1 to 4 weeks for xylene (Howard, 1991). BTEX is also not expected to significantly adsorb to sediment and bioconcentrate in aquatic organisms based on their low K_{oc} value and low bioconcentration factor (BCF) values.

D.2.3.3 METALS

Metals which are COPCs in groundwater and/or LNAPL include arsenic, chromium, lead, mercury, nickel, vanadium and zinc.

The fate and transport of metallic species in the environment depends upon such factors as sorption, chemical speciation and complexation, biological transformation, and bioaccumulation. In general, the primary fate of metals is adsorption to soil and sediment. The migration of metals from soil occurs primarily by infiltrating water transport of the dissolved metal ions through the soil column. Factors which may affect the transport of metals in soils and sediments include the following:

- soil composition and pH,
- site geology and hydrogeology,
- groundwater pH,
- metal concentrations,
- mechanisms of adsorption and desorption,
- sorption of metals to iron and manganese oxides in soils,
- the amount of infiltration, and
- the cation exchange capacity of clay minerals.

The remainder of this section describes the fate and transport mechanisms for the specific metals of concern.

Arsenic - The oxidation state of arsenic is extremely important in evaluating both its behavior in the environment and its toxicity. Arsenic exists primarily in the +5 oxidation state (arsenate) in aerobic soils and the +3 oxidation state (arsenite) in slightly reduced soils. The Refinery soils are likely to be aerobic, due to their proximity to the surface and the high porosity of karst soils, and therefore arsenic is likely to exist primarily as arsenate. The fate of arsenic in soil is adsorption and leaching into groundwater. Arid and limestone soils and subsoils high in clay and iron oxides have a greater holding capacity for arsenic than other types of soil. Complexation and chelation by organic material, iron or calcium tend to retain arsenic in an insoluble form in soil. The distribution coefficient (K_d) is the soil-water partition coefficient which measures the tendency of a chemical to bind to soil. The K_d ranges from approximately 50 to 100. Compared to other metals such as lead, this K_d is low, indicating that arsenic species may be relatively more mobile in the environment.

Leaching of arsenic is possible in sandy soils; however leaching is usually only important in the top 30 centimeters (cm) of soil (ATSDR, 1990a). In water, arsenic may be found in any of four oxidation states: +5, +3, 0, and -3; however, the +5 and +3 oxidation states are the most common under natural conditions. Once in water, arsenic tends to be relatively mobile. Arsenic in water and soil may be reduced and methylated by fungi, yeasts, algae, and bacteria. Methylated arsenic derivatives are extremely volatile and are quite stable in the atmosphere. Bioconcentration factors experimentally determined for aquatic organisms are low, except for algae (Eisler, 1988). Most mammals rapidly excrete ingested inorganic arsenic in their urine as methylated derivatives (Eisler, 1988). Therefore, arsenic generally has a low potential to bioaccumulate through the food chain.

Chromium. Chromium can exist in the environment in two redox states, hexavalent chromium and trivalent chromium. At acidic pHs (4.5-6) hexavalent chromium exists primarily as the chromate anion $HCrO_4^-$. The anionic character of this metal species results in a high mobility in the environment. For example, sandy soils containing quartz and silica will tend to adsorb positively charged metal species and reduce their mobility. However, negatively charged metal species are not readily adsorbed, and therefore are more mobile. In addition, due to the chemical nature of the chromate anions, the bonding to soil and mineral surfaces is weak. Thus, when hexavalent chromium compounds are released into the soil, they tend to remain soluble and are readily leached through the soil column into groundwater. Acidic soils rich in iron oxides like goethite and hematite can adsorb negatively charged hexavalent chromium species and thereby decrease its mobility.

Trivalent chromium is much less mobile in the environment than hexavalent chromium. At low pHs (acidic conditions), the positive trivalent species such as $Cr(OH)^{2+}$ and $Cr(OH)_2^{+}$ are readily adsorbed by negatively charged soil surfaces such as clay minerals, organic matter, and carbonate minerals. In addition, the chromium cation forms strong complexes with iron and manganese hydroxides. At higher pHs (i.e. more basic conditions) the trivalent chromium species precipitates as the hydroxide $Cr(OH)_3$ and mixed hydroxide/carbonate salts. Thus, trivalent chromium species are less mobile at both low and high pHs.

Under acidic conditions (i.e. pH<5) and in the presence of organic material or other good electron donors (i.e. reducing agents such as sulfur dioxide, sodium bisulfite, or ferrous sulfate) hexavalent chromium is readily reduced in both soil and groundwater. The reported half-life for hexavalent chromium reduction in loamy soil at pH 5 is 55 days. Likewise the half-lives for hexavalent chromium reduction by ferrous iron are 28 days and 41 days for pH 4 and pH 5 soil/water suspensions, respectively. Thus, hexavalent chromium predominates under oxidizing (high redox) conditions and high pH conditions, whereas trivalent chromium predominates under reducing (low redox) and low pH conditions. Once hexavalent chromium is reduced to trivalent chromium, it is not easily reoxidized back to the hexavalent state.

The speciation of chromium in Refinery wastes applied to the landfarm was reported in the No-migration Petition for the Land Treatment Facility (LTF) (RETEC, 1990). The LTF received wastes (i.e., API separator sludge, pond sludges, algae skim, tank bottom sludges, oily sludge, jet filter clay, cat fines, and miscellaneous oily soils) with Pond sludges representing the majority of the waste. Weighted average concentrations of chromium species were calculated from the percent of each waste stream applied to the LTF from 1980 to 1987. The hexavalent chromium to total chromium ratio in the industrial waste was approximately 1:100 (RETEC, 1990). The current site conditions (*i.e.* pH 7.5 to 8.3, 0.0001 percent organic carbon) tend not to favor rapid hexavalent chromium reduction; however, the speciation of the waste indicates that only 1 percent of the chromium in the waste was in the hexavalent state to start. Over time, hexavalent chromium may be slowly reduced to trivalent chromium in soil under the current site conditions. Greater than 99 percent of the total chromium at the Refinery is likely to be trivalent chromium, which is both less toxic and less mobile than hexavalent chromium. Thus, the trivalent chromium is likely to be retained in the soil at the Refinery.

Chromium does not appreciably bioaccumulate in the aquatic food chain. Bioconcentration factors of approximately 1 for bluegill have been reported (ATSDR, 1990b).

Lead. The lead species that is the most prevalent in the environment is the bivalent cation Pb^{2+}. Lead migration in aqueous media is primarily dependent on pH, but it may be significantly inhibited by adsorption onto soil. Lead solubility increases at the extremes of pH, and exhibits a minimum in the moderate pH range. In general, the pH of the Refinery soils is moderate (7.5 to 8.3) (Dames & Moore, 1996a). Thus, lead should primarily be retained in the soil. Lead that is dissolved by infiltrating water is subject to precipitation as the carbonate, sulfide, and sulfate species ($PbCO_3$, PbS, and $PbSO_4$, respectively). It is subject to adsorption onto hydrous iron and manganese oxides or organic matter (EPA, 1984). In surface water, lead is commonly associated with particulate material. Aquatic organisms evidence a tendency towards bioaccumulation of organic lead. Although under strict anaerobic conditions, biological activity may transform inorganic lead through biomethylation into organic lead, which is more mobile and more likely to bioconcentrate and bioaccumulate (ATSDR, 1990, site conditions are likely to be aerobic due to the characteristics of the Karst soils. Most median BCF values for aquatic biota are significantly lower than oysters (6,600) and freshwater algae (92,000): 42 for fish, 536 for oysters, 500 for insects, 725 for algae, and 2,570 for mussels (Eisler 1988). Biomagnification of lead compounds through the food chain has not been shown and depuration of organolead is relatively rapid (Eisler 1988).

Mercury. Mercury can exist in the environment in any one of three different oxidation states: 0, +1, and +2. The valence state of mercury is determined both by the pH and ionization potential of the surroundings. Under oxidizing environments, mercury exists mainly in the +1 and +2 oxidation states.

The transport of mercury in groundwater is retarded by strong sorption to aquifer materials, such as clay minerals, organic matter, and carbonate minerals. Thus, it is unlikely that significant levels of mercury would undergo long range transport to reach the ocean. However, if mercury is transported to the ocean, the major removal mechanism from a surface water system is adsorption onto surfaces of particulates and subsequent settling to sediment. The overwhelming majority of any dissolved mercury is removed in this manner within a relatively short time, generally in the immediate vicinity of the source.

Much smaller portions of dissolved mercury are ingested by aquatic biota or transported by current movement and dilution. Secondary transformations of mercury in the sediments can occur, including precipitation as mercuric sulfide and methylation by bacteria. Since the mercury itself is not destroyed, these inorganic and organic forms of mercury may then release ionic or metallic mercury into the water column as part of a recycling process. Resuspension of sediments by

turbulence or the activity of benthic organisms can also release these compounds of mercury directly into the water column. Thus, the primary sink for mercury released to surface water is the sediment. Biomethylation of mercury in sediments can result in remobilization. Since dimethyl mercury has a low solubility in water and is a gas at room temperature, volatilization may occur. Mercury is strongly bioaccumulated (Eisler, 1987b).

Nickel. Nickel occurs in the environment primarily in the +2 oxidation state. In soil, nickel is reasonably mobile in low pH and cation exchange capacity mineral soils, but is less mobile in basic mineral soils and soils with high organic content. In general, nickel at the Refinery is not expected to be significantly mobile given the basic conditions (pH of 7.5-8.3) and mineralized (coralline) soils. Nickel is immobilized in soil as nickel ferrite, since carbonate, sulfates and halide salts of nickel are too soluble to precipitate out of solution in soil. If nickel were to be leached into groundwater, it may be potentially transported to the ocean. In aerobic natural waters with pH between 6 and 9, nickel exists as the free aqua species ($Ni(H_2O)_6^{2+}$) and as soluble complexes with hydroxide, sulfate, chloride, and ammonia (ATSDR, 1988a). At pH >9, hydroxide and/or carbonate species of nickel precipitate from solution. The presence of organic materials such as humic acids tend to keep nickel solubilized by complexation. Nickel is not accumulated in significant amounts by aquatic organisms (ATSDR, 1988a). A range of BCFs of 40-100 in fish and 100-259 in invertebrates has been reported. Nickel does not readily bioaccumulate through trophic levels

Vanadium - Vanadium exists in the natural environment in the +5, and +3 oxidation states (ATSDR, 1990c). In soil, the mobility of vanadium is affected by the pH and oxidation potential of the soil. Relative to other metals, vanadium is fairly mobile in neutral or alkaline soils, but its mobility decreases in acidic soils or under reducing, saturated conditions. Soils containing high levels of iron and manganese oxides retain vanadium. In water, vanadium generally exists in solution as the vanadyl species, VO^{2+} and $VO(OH)^{+}$, and the vanadate species, $H_2VO_4^-$ and HVO_4^{2-}. Both vanadate and vanadyl species are known to bind strongly to mineral or biogenic surfaces by adsorption or complexation. Therefore, these chemical species are not expected to exhibit long-range transport in groundwater in waters containing high levels of particulate or organic matter. As such, vanadium generally is associated with the solid material and is not particularly mobile. Vanadium has a low potential to bioconcentrate in fish, with a BCF of approximately 10 to 100 (ATSDR, 1990c).

Zinc. Zinc is found naturally in the environment and is present in all foods (ATSDR, 1988b). Zinc can occur in both suspended and dissolved forms in surface water. Zinc chloride and zinc sulfate

are very soluble in water but hydrolyze in solution to form a zinc hydroxide precipitate. However, sorption is the predominant fate process for zinc in aquatic environments (ATSDR, 1988b). Zinc partitions to sediments or suspended solids in surface waters through sorption onto hydrous iron, manganese oxides, clay minerals or organic material (ATSDR, 1988b). Zinc is relatively non-toxic to birds and a wide margin of safety exists between normal intakes and those likely to cause deleterious effects (Gough et al., 1979). In column leaching tests with sediment collected from the banks of the Rhone River, the presence of dissolved organic matter and pH were found to be the factors controlling the adsorption and mobility of zinc (ATSDR, 1988b). Zinc is an essential nutrient and is bioaccumulated by biota to some extent. However, this is a minor reservoir relative to sediments (ATSDR, 1988b).

D.3 POTENTIALLY EXPOSED POPULATIONS

Human and ecological receptors potentially associated with the Backyards Area and nearby areas or habitats are presented in this section.

D.3.1 HUMAN RECEPTORS

The potential human receptor populations under current and possible future conditions are:

Current Conditions
- On-site Workers;
- Off-site Workers; and
- Recreational Users

Future Conditions
- On-site Workers;
- Off-site Workers;
- Recreational User; and
- Construction Workers

D.3.1.1 Current Conditions

On-site workers are located in the small warehouse, and occasionally in the acid plant in the Backyards Area. The LNAPL plume underlies these structures. On-site workers are also located in other structures (i.e., the maintenance shop and storehouse, welding building, and another storehouse) in the Backyards Area (Figure D-2). However, the LNAPL plume and dissolved phase have not impacted that area based on visual observations and intrinsic parameters (Figure D-3). The nearest off-site workers are currently located at a chemical company approximately 500 feet to the south of the plume (Figure D-2). Recreational users (e.g., snorkelers, swimmers, fisherman, etc.)

visiting the beach located at the Refinery property border could potentially be exposed to site-related chemicals. There are several areas of access to the shoreline along the Refinery property border, including at the terminus of a road in a new development area approximately 400 feet north of the Refinery (Figure D-2), a public access at Kaomi Loop approximately 2000 feet to the south of the Refinery, and at the City/County Park at Olai Street approximately 0.9 miles to the south of the Refinery. Recreational fishermen are reported to fish along the coastline of the Pacific Ocean. Approximately four or five individuals have been observed during the evening hours or on weekends. Throw netting is generally used to capture small reef fishes. Whip fishing is another common practice. Traps are occasionally set for Hawaiian slipper lobster and crabs.

Some human populations (e.g., elderly, children, or the infirm) may be particularly sensitive to environmental contaminants. Therefore, the potential for chemical transport off the property to sensitive receptors was evaluated (e.g., vapors). Seagull School is a preschool and day care located on Makakailo Drive and Farrington Highway. This school is located approximately 2.5 miles to the north and east of the site and is opposite the predominant westerly wind direction. Barber's Point School is the nearest elementary school which is located at the Naval Air Station approximately 1.75 miles to the east and north of the site. The nearest residential neighborhood is also located at Barber's Point Naval Air Station. This area is also located opposite the predominant wind and groundwater flow direction. Given the distance to these schools and neighborhoods and the predominant wind direction, it is unlikely these populations would be significantly exposed to airborne petroleum hydrocarbons emanating from the Backyards Area. Also, given the distance to the nearest residential neighborhood (i.e., Barber's Point) and schools, and the presence of security guards in the area, trespassers are unlikely to occur on the Backyards Area. Since the inhalation of chemicals in outdoor air by trespassers is likely to be infrequent and of limited exposure duration, trespassers would be less exposed than on-site workers which were already selected for evaluation

D.3.1.2 Future Conditions

The Refinery is a petroleum processing facility that is expected to remain in operation in the foreseeable future. Nonetheless, it is conceivable that additional buildings could be added in the Backyards Area. Therefore, it was assumed that another building could be constructed over the LNAPL plume. Construction workers could be involved in the building construction and contact COPCs at the site. Therefore, the populations of concern would be the future construction workers, on-site workers employed on the site and future off-site workers.

D.3.2 ECOLOGICAL RECEPTORS

Ecological receptors potentially exposed to site contaminants will vary depending on habitat type and whether or not the species is associated with an aquatic or terrestrial environment.

D.3.2.1 Habitat

The Backyards Area consists of barren soil. Disturbed grasses have sparsely revegetated the sides of roads. Given the lack of cover and food resources, it has limited suitability as terrestrial wildlife habitat.

The western boundary of Backyards is located to the east of the leeward shore of the Pacific Ocean. In general, the habitat of the ocean in this area consists of a limestone shelf interrupted with pockets and crevices of sand which experiences frequent surge (Kay and Smalley, 1996).

D.3.2.2 Terrestrial Receptors

Under current conditions, Zebra Dove (*Geopelia striata*), Common Myna (*Acridotheres tristis*) and House Sparrow (*Passer domesticus*) could occasionally occur on the Backyards Area. A Hawaiian mongoose was also observed on Malakole Street during a site visit.

Under future conditions, species such as the Japanese White-eye (*Zosterops japonicus*), Red-vented Bulbul (*Pycnonotus cafer*), Zebra Dove (*Geopelia striata*), Common Myna (*Acridotheres tristis*), House Finch (*Carpodacus mexicanus*) and House Sparrow (*Passer domesticus*) could potentially occur if landscaping is associated with industrial development.

D.3.2.3 Aquatic Receptors

Biological monitoring reports were used to characterize the species which might occur in the near shore habitat of the Pacific Ocean under current and future conditions (Kay and Smalley, 1996). Based on these reports, which represent 10 years of monitoring data, species likely to be present in the area include corals, (e.g., *Pocillopora meandrina*), epifaunal and micrograzer micromollusks (i.e., mollusks with shells less than 10 mm in greatest dimension), and a variety of fish. Sergeant Major (*Abudefduf abdonminalis*), surgeonfish (*Acanthurus sp., Ctenochaetus striogosus*), goatfish (*Parupeneus multifasciatus*), *Adioryx/Myrispristis*, and *Thalasoma duperreyi* were the most

consistent and generally abundant fish species observed over the study period. In addition, pelagic birds such as Brown Noddy *(Anous Stolidus)* and shore birds such as the Wandering Paddler *(Heteroscelus Incanus)* could occur along the Pacific Ocean shoreline.

D.3.2.4 Sensitive Ecological Receptors

No threatened or endangered species are known to occur at the Backyards Area. The Hawaiian Black-necked Stilt (*Himantopus mexicanus knudseni*) is a federally endangered species that is known to occur in the Rowland's Pond area of the Refinery year-round (USFWS, 1993) (Figure D-2). Rowland's Pond is located approximately 1500 feet to the east of the Backyards Area. In addition, the Land Treatment Facility (LTF) located approximately 750 feet from the Backyards Area (Figure D-2), has historically been utilized by the endangered Hawaiian Black-necked Stilt during the nesting season. However, this area is currently undergoing closure. The endangered Hawksbill turtle *(Eretmochelys imbricata)* and the threatened green sea turtle *(Chelonia mydas)* could also occasionally occur in the off-shore waters of the Pacific Ocean.

D.3.3 EXPOSURE PATHWAYS

A complete exposure pathway consists of four elements:

- A source and mechanism of chemical release to the environment;
- An environmental transport medium (*e.g.*, air, groundwater, fugitive dust emissions, contaminant movement through soil, soil runoff into water bodies) for the released chemical;
- A point of potential receptor contact with the contaminated medium; and
- A route of entry into human or ecological receptors, either via inhalation, ingestion, or contact with the contaminated medium.

The primary transport mechanisms are identified in Figures D-7 and D-8 for human and ecological receptors, respectively.

D.3.3.1 Exposure Pathways for Human Receptors

Figure D-7 presents the refined CSM for human receptors at the Backyards Area. Table D-8 presents a summary of the potentially complete and significant exposure pathways for human receptors under current and future conditions.

D.3.3.1.1 Current Conditions

The Refinery is a petroleum processing facility that is expected to remain in operation in the foreseeable future. A warehouse is located over the LNAPL plume and on-site workers could potentially be exposed to volatile COPCs in indoor air. This pathway will be evaluated in a separate report for the on-site industrial worker. On-site workers could potentially be exposed to volatile CPCs in ambient (outdoor) air; however, due to the dispersion of vapors by mixing with ambient air, such exposures are insignificant as compared to indoor air exposures.

Currently, the Backyards Area is primarily used for storage of materials and for operating the acid plant and workers are not engaged in subsurface soil activities. Therefore, current workers are not exposed to potentially contaminated subsurface soils. With the exception of the North and South Ocean Pond and the Amine Wash Water Impoundment, no other Backyards Areas were determined in the RFI Investigation to be significant areas of surface or near-surface soil impacts. The Amine Wash Water Impoundment has been filled since the time of the RFI and regraded and surface soils are not likely to contain significant levels of chemicals. The North and South Ocean Ponds contain barrier netting, access is difficult, and these areas are located away from areas where Refinery workers are routinely found, such that direct contact (ingestion, dermal contact, and inhalation of dust) exposure is unlikely. Thus, current workers are not likely to be exposed to contaminated soils in these areas. Off-site workers at a nearby chemical company are not located in the predominant downwind and are not expected to be significantly exposed to volatilized contaminants or dust contaminants due to the dispersion of vapors/dust in outdoor air.

The Refinery SPCC plan requires that the drainage areas associated with stormwater discharges (i.e., Discharge 003 in the Backyards Area) (Figure D-2) are routinely inspected for oil or other contaminants on the ground and any spills are immediately cleaned up. Therefore, any potential surface soil contamination which may have occurred in the Backyards Area subsequent to the preparation of the RFI report has likely been cleaned up. Thus, exposures via direct contact routes

(i.e. incidental ingestion, inhalation of soil dust, and dermal contact) are considered incomplete exposure pathways for surface soils.

As indicated in Section D.2.2.2, groundwater is not used as a domestic water source and is not potable. There are two industrial supply wells located at the Acid Plant, which are used for cooling and process water (Dames & Moore, 1996b). However, the groundwater is contained within equipment and no direct contact occurs. Therefore, for groundwater, direct contact exposure routes are incomplete exposure pathways. Although visual observations and monitoring data indicate LNAPL has not impacted the ocean, chemicals in dissolved phase groundwater have been detected in wells along the western Refinery property boundary near the Pacific Ocean. Therefore, for surface water, direct and indirect (i.e. fish ingestion) routes are potentially complete exposure pathways for the recreational water users.

D.3.3.1.2 Future Conditions

The Refinery is expected to remain in operation in the foreseeable future. Under future conditions, it was conservatively assumed that an industrial building would be constructed over the LNAPL plume. Because volatile COPCs were identified in the LNAPL at the site, the inhalation of vapors in indoor air is a potentially complete exposure pathway for future on-site workers. Under the future conditions, construction workers in on-site areas were assumed to engage in excavation activities which could result in direct contact with subsurface contamination and inhalation of vapors. As under current conditions, future off-site workers are only expected to be exposed via air pathways.

In the future, groundwater is assumed not to be used as a domestic water source since it is not potable. However, groundwater could potentially be developed for industrial use or for irrigation use (although such irrigation use is unlikely due to the high TDS values). While direct contact with groundwater may possibly occur (e.g., during landscape irrigation, spraying for dust control, or in open industrial uses), such exposures are reasonably expected to be infrequent and of limited duration. Therefore, for groundwater, direct contact exposure routes are either incomplete or insignificant exposure pathways for future on-site workers.

Recreational users could be exposed to COPCs in the Pacific Ocean via direct and indirect (i.e. fish ingestion) routes in the future. Refinery investigations indicate intrinsic biodegradation of dissolved phase organics is occurring based on trends in sulfate, dissolved oxygen and oxidation reduction

potential reducing chemical concentrations at the point of exposure for recreational users. Conceptually, there may be the potential for COPCs in LNAPL to migrate at some point in the future to the Pacific Ocean via transport with groundwater flow. However, due to the flat regional groundwater gradient, and the limited volume of LNAPL present (conservative estimate of less than one foot at the leading edge), the potential for migration of LNAPL plume to reach the Ocean is considered to be low.

D.3.3.2 Exposure Pathways for Ecological Receptors

Figure D-8 presents the refined CSM for ecological receptors at the Backyards Area. Table D-8 presents a summary of the potentially complete and significant exposure pathways for ecological receptors under current and future conditions.

D.3.3.2.1 Current Conditions

Terrestrial Receptors. As indicated in Section D.2.2.1, only near-surface soils in the North and South Ocean Ponds have been chemically impacted; however, the North and South Ocean Ponds contain barrier netting to prevent access. Because the contamination is located below the ground surface, inhalation of vapor is the only potentially complete exposure pathway for terrestrial receptors at the Backyards Area. However, inhalation exposure to terrestrial avian and mammalian species migrating across the site is expected to be minimal. Because it is currently a flat, open area devoid of vegetation, limited occurrence of terrestrial species engaged in foraging or other activities is expected due to the lack of suitable cover and food sources.

Aquatic Receptors. There are no surface water bodies on the site. Stormwater runoff is managed under Chevron's stormwater pollution control plan. The Refinery SPCC plan requires that the drainage areas associated with these stormwater discharges are routinely inspected for oil or other contaminants on the ground and any spills are immediately cleaned up. The Backyards Area is graded so that stormwater runoff flows off the Refinery property into the Pacific Ocean between the North and South Ocean Ponds. No significant surface soil contamination has been identified in this area. Therefore, runoff is not considered a significant exposure pathway for aquatic organisms.

Based on visual observations and existing data, the leading edge of the hydrocarbon plume has not reached the western Refinery boundary. Therefore, LNAPL migration to the ocean is not believed to have occurred and there is no complete exposure pathway for LNAPL under current conditions.

However, because COPCs have been detected in wells nearest the ocean, there is a potentially complete exposure pathway for the dissolved phase of the LNAPL plume. However, Refinery investigations indicate intrinsic biodegradation of dissolved phase organic COPCs is occurring based on trends in sulfate, dissolved oxygen and oxidation reduction potential, reducing the mass of COPCs in groundwater near the ocean.

D.3.3.2.2 Future Conditions

Conceptually, there may be the potential for LNAPL to migrate at some point in the future to the Pacific Ocean via transport with groundwater flow and impact aquatic organisms. In addition, if the LNAPL were to create a sheen upon the surface of the Pacific Ocean, a physical, as well as chemical hazard could exist. The physical hazards of petroleum to breeding birds have been well-documented in the literature (Hoffman, 1979; Hoffman and Albers, 1984; Coon et al., 1979). The transfer of as small a quantity of oil to the egg surface as 1 microliter (μl) of No. 2 fuel oil is sufficient to reduce hatchability of Mallards (Albers, 1976). Similar results have been observed in Herring Gulls, Louisiana Heron, Sandwich Terns and Common eider (Harfenist et al., 1990; White et al., 1979; Szaro and Albers, 1976). However, due to the flat regional groundwater gradient, and the limited volume of LNAPL present (conservative estimate of less than one foot at the leading edge), the potential for migration of LNAPL plume to reach the Ocean is considered to be low.

D.4 QUALITATIVE RISK EVALUATION

The purpose of this refined CSM is to identify the COPCs, the populations which could be exposed and the complete exposure pathways and to qualitatively evaluate the potential risks associated with chemical exposure. This section summarizes the results of the refined CSM and describes the potential significance of these results. The COPCs for each environmental medium are summarized in Section D.4.1. The populations of potential concern and complete and potentially significant exposure pathways are summarized in Table D-8. The potential significance of the results of the refined CSM is discussed in sections D.4.1 and D.4.2. Section D.4.3 describes the identified areas of uncertainty in the risk evaluation.

D.4.1 HUMAN HEALTH EVALUATION

D.4.1.1 Soil COPCs

As discussed in Section D.3.3.1, exposures via direct contact routes are considered incomplete exposure pathways for surface soils.

Although COPCs may be associated with the subsurface soils in the capillary fringe zone in the plume area of the Backyards Area, direct contact pathways for subsurface soils for current and future on-site and off-site workers are incomplete. The relative contribution of volatile COPCs in soils relative to the volatile COPCs in LNAPL is considered minimal. Because institutional controls (e.g., health and safety plans) are available to address potential exposures to construction workers who could potentially come in contact with the impacted subsurface soils, further analysis to evaluate health risks is not recommended at this time.

D.4.1.2 Dissolved Phase COPCs

The COPCs for dissolved phase groundwater for human receptors are summarized below.

Dissolved Phase Groundwater COPCs			
HMW PAHs	***LMW PAHs***	***Other SVOCs***	***Metals***
Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(g,h,i)perylene Chrysene Dibenz(a,h)anthracene Indeno(1,2,3-cd)pyrene	Naphthalene	Bis (2-ethylhexyl)phthalate	Arsenic Chromium Lead Mercury

DEHP in Well D6-R34 exceeded the RBSL. DEHP is a common laboratory contaminant, and is not considered a common constituent of petroleum hydrocarbons. It also was detected at a lower concentration in I3-67 (background well), suggesting it is not associated with the LNAPL plume. Based on the fate and transport characteristics, DEHP is strongly adsorbed to soil, and is relatively immobile in the environment. DEHP was not retained as a COPC based on levels found in wells nearest the ocean. Therefore, DEHP is unlikely to pose a human health threat to recreational users

at the point of exposure (Pacific Ocean), because environmental fate mechanisms appear to be reducing chemical levels. Although DEHP is semi-volatile, because it is strongly adsorbed to soil and was only detected above the RBSL in one location, it is unlikely to pose a health threat to current and future on-site and off-site workers.

Naphthalene is a semi-volatile chemical and exposure to current and future on-site workers via inhalation of vapor is a potentially complete exposure pathway. This exposure will be addressed in a separate report which evaluates an industrial worker scenario using a worst-case indoor air scenario for buildings at the Refinery. Current and future off-site worker exposures are insignificant in comparison to on-site workers. Naphthalene was not retained as a COPC based on levels found in wells nearest the ocean. Therefore, naphthalene is unlikely to pose a human health threat to recreational users at the point of exposures (Pacific Ocean) because environmental fate mechanisms appear to be reducing chemical levels.

Seven HMW PAHs exceeded the RBSLs. The maximum detected concentration was located in well D7-33 for all of these PAHs. However, all of these PAHs were nondetects in the downgradient well (D7-51). Based on the fate and transport characteristics, the HMW PAHs are strongly adsorbed to soil, are not volatile, and are relatively immobile in the environment. Therefore, the HMW PAHs are unlikely to pose a human health threat to current and future on-site and off-site workers or recreational users.

Arsenic, chromium, lead, and mercury were retained as COPCs based on protection of human health. These metals are not volatile and will not pose a hazard to current and future on-site workers. Groundwater is not used as a domestic water source and is not potable. Industrial use of groundwater is possible, but exposures are likely to be insignificant. Therefore, for groundwater, direct contact exposure routes are either incomplete or insignificant exposure pathways for current and future on-site and off-site workers.

For recreational users, only arsenic and mercury exceeded RBSLs in wells located nearest to the ocean. Arsenic was detected in well D8-48 which is located near the shoreline at 7.1 μg/L which exceeds the RBSL. However, it should be noted that this concentration is generally comparable to arsenic levels typically found in natural seawater (up to 6 μg/L) (Welch et al., 1988). As such, the arsenic at the shoreline could be associated with natural background levels. Mercury was detected at 0.00033 μg/L in a well nearest the ocean which exceeded the RBSL. This level is below the reported level of mercury found in the open ocean (0.0053 μg/L) (Eisler, 1987b). In addition,

mercury was not detected in wells within the LNAPL plume, indicating the mercury is probably not associated with the LNAPL.

Under the future conditions, assuming that a new industrial building is built over the LNAPL plume at the Backyards Area, construction workers may potentially contact dissolved phase groundwater during excavation activities. Because institutional controls (e.g., health and safety plans) are available to address potential exposures to construction workers, further analysis to evaluate health risks to construction workers is not recommended at this time.

D.4.1.3 LNAPL

The COPCs for LNAPL for human receptors are summarized below.

LNAPL COPCs			
HMW PAHs	***LMW PAHs***	***Metals***	***VOCs***
chrysene	1-methylnaphthalene	arsenic	benzene*
pyrene	2-methylnaphthalene	chromium	ethylbenzene
	acenaphthene	copper	toluene
	fluorene	vanadium	total xylenes
	naphthalene		
	phenanthrene		

* Not detected in any sample.

Volatile COPCs (i.e. the six LMW PAHs and four VOCs listed above) were identified in the LNAPL. On-site workers currently working in the warehouse and the acid plant building and future on-site workers located in a future building constructed over the LNAPL plume may potentially be exposed to significant levels of volatile COPCs in indoor air. However, these exposures will be addressed in a separate report which evaluates an industrial worker scenario using a worst-case indoor air scenario for buildings at the Refinery. Due to downwind dispersion, current and future off-site workers are not likely to be exposed to significant levels of volatile COPCs in outdoor air. Construction workers involved in developing a new industrial building may potentially be exposed to COPCs in LNAPL. However, because institutional controls (e.g., health and safety plans) are available to address potential exposures to construction workers, further analysis to evaluate health risks is not recommended at this time.

Under current conditions, LNAPL has not reached the ocean, and therefore there are no complete pathways for recreational users at this time. Conceptually, there may be the potential for LNAPL to migrate at some point in the future to the Pacific Ocean via transport with groundwater flow and impact recreational users. Due to the flat regional groundwater gradient and the limited volume of LNAPL present (conservative estimate of approximately one foot maximum in the Backyards Area) the potential for migration of the LNAPL plume to the Ocean in the future is considered to be low.

D.4.2 ECOLOGICAL EVALUATION

The only potentially complete exposure pathway for terrestrial ecological receptors is inhalation of vapor. Given the lack of suitable cover and food resources, this exposure is expected to be insignificant. Based on data for wells nearest the ocean, dissolved phase groundwater is not currently adversely impacting aquatic organisms in the ocean (Table D-6). Available site investigation data indicate that under current conditions, the LNAPL plume does not appear to have reached the Pacific Ocean. In the future, if the LNAPL and dissolved phase groundwater were to reach the ocean without significant dilution and attenuation, it is possible that potential adverse impacts to aquatic organisms could occur. However, because of the flat regional groundwater gradient, and the limited volume of LNAPL present, the potential for migration of LNAPL plume to reach the Ocean in the future is considered to be low.

D.4.3 UNCERTAINTY

The major sources of uncertainty are:

- The use of the maximum detected chemical concentration in the comparison to RBSLs is highly conservative, albeit appropriate, for the chemical selection process.

- The use of human health RBSLs derived for a drinking water scenario is highly conservative for this site.

- The human health RBSLs based on seafood/shellfish ingestion were conservatively applied to groundwater even though the point of exposure is the Pacific Ocean. Due to the flat regional groundwater gradient, and the limited volume of LNAPL present, the potential for migration of LNAPL plume to reach the Ocean is considered to be low.

- Many of the detected concentrations were "J" qualified. There is less certainty in the chemical data quantification levels for these data points.

- Analytical data for metals was reported for the total metal content. The dissolved phase is generally considered the bioavailable portion of metals for aquatic organisms. Thus, the use of the total analyses is highly conservative in evaluating the potential for adverse impacts. In addition, seven HMW PAHs were retained as dissolved phase groundwater COPCs. However, these contaminants may be associated with particulates since they are not readily soluble in water.

- The method detection limit (MDL) was used when evaluating the adequacy of detection limits. Only benzene was retained as a COPC based on the detection limit exceeding RBSLs.

- Background comparisons were not used to eliminate COPCs. However, arsenic levels in occurring naturally in seawater were compared to arsenic levels at the site.

D.5 REFERENCES

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TABLE D-1
BACKYARDS AREA
GROUNDWATER ANALYTICAL DATA

ANALYTE	UNITS	AREA	BACKGROUND		FRINGE					
		LOCATION	C2-64	I3-67	C4-76	C4-76	C6-R04	C6-R36	C6-R36	C6-R37
		DATE	06/20/96	06/21/96	06/24/96	06/24/96	06/21/96	06/21/96	06/21/96	06/20/96
		QA				D			D	
VOLATILE ORGANIC COMPOUNDS										
1,2-DICHLOROBENZENE	ug/L		<5	<5	<5	<5	<5	--	--	--
1,3-DICHLOROBENZENE	ug/L		<5	<5	<5	<5	<5	--	--	--
1,4-DICHLOROBENZENE	ug/L		<5	<5	<5	<5	<5	--	--	--
BENZENE	ug/L		<5	<5	<5	<5	<5	<5	<5	<5
ETHYLBENZENE	ug/L		<5	<5	1.4 J|JQ	1.3 J|JQ	<5	<5	<5	<5
TOLUENE	ug/L		<5	<5	<5	<5	<5	<5	<5	<5
XYLENES (TOTAL)	ug/L		<10	<10	5.1 J|JQ	4.6 J|JQ	<10	<10	<10	<10
SEMI-VOLATILE ORGANIC COMPOUNDS										
BENZO(A)ANTHRACENE	ug/L		<0.1	<0.1	<0.1	<0.11	<0.1	<0.1	<0.1	<0.1
BENZO(A)PYRENE	ug/L		<0.1	<0.1	<0.1	<0.11	<0.1	<0.1	<0.1	<0.1
BENZO(B)FLUORANTHENE	ug/L		<0.1	<0.1	<0.1	<0.11	<0.1	<0.1	<0.1	<0.1
BENZO(G,H,I)PERYLENE	ug/L		<0.1	<0.1	<0.1	<0.11	<0.1	<0.1	<0.1	<0.1
CHRYSENE	ug/L		<0.1	<0.1	<0.1	<0.11	<0.1	<0.1	<0.1	<0.1
DIBENZ(A,H)ANTHRACENE	ug/L		<0.1	<0.1	<0.1	<0.11	<0.1	<0.1	<0.1	<0.1
INDENO(1,2,3-CD)PYRENE	ug/L		<0.1	<0.1	<0.1	<0.11	<0.1	<0.1	<0.1	<0.1
PYRENE	ug/L		<0.1	<0.1	0.17	0.16	<0.1	0.13	0.11	0.12
LOW MOLECULAR PAHs										
2-CHLORONAPHTHALENE	ug/L		<10	<10	8.1 J|JQ	<10	<10	--	--	--
2-METHYLNAPHTHALENE	ug/L		<10	<10	6.9 J|JQ	<10	<10	--	--	--
ACENAPHTHENE	ug/L		<0.1	<0.1	12	9.8	<0.1	<0.1	<0.1	<0.1
ACENAPHTHYLENE	ug/L		<0.1	<0.1	1.7	1.6	<0.1	<0.1	<0.1	<0.1
ANTHRACENE	ug/L		<0.1	<0.1	0.58	0.35	<0.1	<0.1	<0.1	<0.1
FLUORANTHENE	ug/L		<0.1	<0.1	<0.1	<0.11	<0.1	<0.1	<0.1	<0.1
FLUORENE	ug/L		<0.1	<0.1	1.3	1.2	<0.1	<0.1	<0.1	<0.1
NAPHTHALENE	ug/L		<0.4 |UJ|	<0.4 |UJ|	5	4.4	<0.4 |UJ|	<0.4 |UJ|	<0.4 |UJ|	<0.4 |UJ|
PHENANTHRENE	ug/L		<0.1	<0.1	0.27	0.23	<0.1	<0.1	<0.1	<0.1
OTHER SVOCs										
BIS(2-ETHYLHEXYL)PHTHALATE	ug/L		<10.	4.7 J|JQ	3.8 J|JQ	<10	<10.	--	--	--
METALS										
ARSENIC	mg/L		0.0059 B|JQ	<0.0030	--	<0.0020 |UJm	<0.0030	0.0059 B|JQ	0.0050 B|JQ	<0.0030
CADMIUM	mg/L		<0.0050	<0.0050	--	<0.0030	<0.0050	<0.0050	<0.0050	<0.0050
CHROMIUM	mg/L		0.028	<0.0060	--	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
LEAD	mg/L		<0.010	<0.010	--	<0.0020	<0.010	<0.010	<0.010	<0.010
MERCURY	mg/L		<0.00020	<0.00020	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
NICKEL	mg/L		0.013 B|JQ	0.039 B|JQ	--	<0.012	<0.013	0.022 B|JQ	0.016 B|JQ	<0.013
VANADIUM	mg/L		0.011 B|JQ	0.0075 B|JQ	--	<0.0060	<0.0070	<0.0070	<0.0070	<0.0070

Refer to end of Table for Qualifier Definitions
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TABLE D-1
BACKYARDS AREA
GROUNDWATER ANALYTICAL DATA

ANALYTE	UNITS	AREA	FRINGE	NEAR OCEAN					
		LOCATION	D7-34	A3-62	B5-R08	C6-56	C6-58	C7-54	D7-51	D8-48
		DATE	06/21/96	06/20/96	06/24/96	06/20/96	06/20/96	06/20/96	06/20/96	06/20/96
		QA								
VOLATILE ORGANIC COMPOUNDS										
1,2-DICHLOROBENZENE	ug/L		<5	--	<5.0	--	--	<5	--	<5
1,3-DICHLOROBENZENE	ug/L		<5	--	<5.0	--	--	<5	--	<5
1,4-DICHLOROBENZENE	ug/L		<5	--	<5.0	--	--	<5	--	<5
BENZENE	ug/L		<5	<5	<5.0	<5	<5	<5	<5	<5
ETHYLBENZENE	ug/L		<5	<5	<5.0	<5	<5	<5	4.9 JJQ	<5
TOLUENE	ug/L		<5	<5	<5.0	<5	<5	<5	1.4 JJQ	<5
XYLENES (TOTAL)	ug/L		<10	<10	<10	<10	<10	<10	17.7	<10
SEMI-VOLATILE ORGANIC COMPOUNDS										
BENZO(A)ANTHRACENE	ug/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BENZO(A)PYRENE	ug/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BENZO(B)FLUORANTHENE	ug/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BENZO(G,H,I)PERYLENE	ug/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
CHRYSENE	ug/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
DIBENZ(A,H)ANTHRACENE	ug/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
INDENO(1,2,3-CD)PYRENE	ug/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
PYRENE	ug/L		<0.1	<0.1	0.17	<0.1	0.17	<0.1	0.11	<0.1
LOW MOLECULAR PAHs										
2-CHLORONAPHTHALENE	ug/L		<10	--	<10	--	--	<10	--	<10
2-METHYLNAPHTHALENE	ug/L		<10	--	<10	--	--	<10	--	<10
ACENAPHTHENE	ug/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.83	<0.1
ACENAPHTHYLENE	ug/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.15	<0.1
ANTHRACENE	ug/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.14	<0.1
FLUORANTHENE	ug/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
FLUORENE	ug/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.8	<0.1
NAPHTHALENE	ug/L		<0.4 UJ	<0.4 UJ	<0.4	<0.4 UJ	<0.4 UJ	<0.4 UJ	<0.4 UJ	<0.4 UJ
PHENANTHRENE	ug/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.21	<0.1
OTHER SVOCs										
BIS(2-ETHYLHEXYL)PHTHALATE	ug/L		<10.	--	<10	--	--	<10.	--	<10.
METALS										
ARSENIC	mg/L		0.16	<0.0030	<0.0020 UJm	<0.0030	<0.0030	<0.0030	<0.0030	0.0071 BSJQ
CADMIUM	mg/L		<0.0050	<0.0050	<0.0030	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
CHROMIUM	mg/L		0.33	0.012	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
LEAD	mg/L		0.32	<0.010	<0.0020	<0.010	<0.010	<0.010	<0.010	<0.010
MERCURY	mg/L		0.0026	<0.00020	0.00033	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
NICKEL	mg/L		0.24	<0.013	<0.012	<0.013	<0.013	<0.013	<0.013	<0.013
VANADIUM	mg/L		0.24	<0.0070	<0.0060	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070

Refer to end of Table for Qualifier Definitions
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TABLE D-1
BACKYARDS AREA
GROUNDWATER ANALYTICAL DATA

	AREA	NEAR OCEAN	OTHER		PLUME		
	LOCATION	D8-50	B4-61	C3-65	D6-R34	D7-15	D7-33
	DATE	06/20/96	06/21/96	06/24/96	06/21/96	06/21/96	06/20/96
	QA						
ANALYTE	UNITS						
VOLATILE ORGANIC COMPOUNDS							
1,2-DICHLOROBENZENE	ug/L	<5	--	<5	<5	--	--
1,3-DICHLOROBENZENE	ug/L	<5	--	<5	<5	--	--
1,4-DICHLOROBENZENE	ug/L	<5	--	<5	<5	--	--
BENZENE	ug/L	<5	<5	<5	<5	3.2 J|JQ	<5
ETHYLBENZENE	ug/L	9.7	<5	<5	5.8	54	9.5
TOLUENE	ug/L	12	<5	<5	<5	55	6.2
XYLENES (TOTAL)	ug/L	131.0	<10	<10	<10	300.0	159.0
SEMI-VOLATILE ORGANIC COMPOUNDS							
BENZO(A)ANTHRACENE	ug/L	<0.1	<0.1	<0.1	<0.1	0.71	3.4
BENZO(A)PYRENE	ug/L	<0.1	<0.1	<0.1	<0.1	0.59	4.4
BENZO(B)FLUORANTHENE	ug/L	<0.1	<0.1	<0.1	<0.1	0.33	2.7
BENZO(G,H,I)PERYLENE	ug/L	<0.1	<0.1	<0.1	<0.1	0.25	3.2
CHRYSENE	ug/L	<0.1	<0.1	<0.1	0.26	1.6	9
DIBENZ(A,H)ANTHRACENE	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	0.96
INDENO(1,2,3-CD)PYRENE	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	0.84
PYRENE	ug/L	<0.1	<0.1	<0.1	0.66	1.9	9
LOW MOLECULAR PAHs							
2-CHLORONAPHTHALENE	ug/L	<10	--	<10	<11	--	--
2-METHYLNAPHTHALENE	ug/L	15.	--	7.8 J|JQ	20.	--	--
ACENAPHTHENE	ug/L	0.9	<0.1	<0.1	2.9	6.9	5.3
ACENAPHTHYLENE	ug/L	0.26	<0.1	<0.1	0.36	2.8	1.8
ANTHRACENE	ug/L	<0.1	<0.1	<0.1	0.22	0.91	2.5
FLUORANTHENE	ug/L	<0.1	<0.1	<0.1	<0.1	0.2	1.3
FLUORENE	ug/L	1.1	<0.1	<0.1	1.2	8	5.3
NAPHTHALENE	ug/L	1.5 |JI	<0.4 |UJI	<0.4	10 |JIi	460 |JI	3.5 |JI
PHENANTHRENE	ug/L	0.38	<0.1	<0.1	0.32	15	4.1
OTHER SVOCs							
BIS(2-ETHYLHEXYL)PHTHALATE	ug/L	3.5 J|JQ	--	3.7 J|JQ	340 E|JQ	--	--
METALS							
ARSENIC	mg/L	0.0047 B|JQ	0.032	0.0043 B|Jm	<0.0030	<0.0030	<0.0030
CADMIUM	mg/L	<0.0050	<0.0050	<0.0030	<0.0050	<0.0050	<0.0050
CHROMIUM	mg/L	<0.0060	0.033	<0.0060	<0.0060	<0.0060	0.039
LEAD	mg/L	<0.010	<0.010	<0.0020	<0.010	<0.010	<0.010
MERCURY	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
NICKEL	mg/L	<0.013	0.014 B|JQ	<0.012	<0.013	<0.013	<0.013
VANADIUM	mg/L	0.012 B|JQ	0.012 B|JQ	<0.0060	<0.0070	<0.0070	<0.0070

Refer to end of Table for Qualifier Definitions
(97HON-464:464D1.xls:16000-533-700x-037)

TABLE D-1 (CONT.)
GROUNDWATER ANALYTICAL DATA
BACKYARDS AREA REFINED CSM
KAPOLEI, OAHU, HAWAII

LABORATORY VALIDATION QUALIFIERS DEFINITIONS
Assigned by PACE Analytical Services, Inc.
(appears in Tables to left of vertical bar)

E	Concentration exceeds linear calibration range. Carried over in the validation process as a "J" qualifier.
U	Not detected at or above the associated reporting limit.
J	Estimated concentration above laboratory method detection limit (MDL) but below laboratory quantitation limit. Carried over in the validation process as a "J" qualifier.
B	Analyte was present in an associated blank.
D	Result from diluted sample.

DATA VALIDATION QUALIFIER DEFINITIONS
Assigned by Dames & Moore's Data Review Team
(appears in Tables to right of vertical bar)

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	Carry over from laboratory "E" or "J" qualifier, or the analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample reporting limit. However, the reported reporting limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

TABLE D-1 (CONT.)
GROUNDWATER ANALYTICAL DATA
BACKYARDS AREA REFINED CSM
KAPOLEI, OAHU, HAWAII

DATA VALIDATION REASON CODE DEFINITIONS
Assigned by Dames & Moore's Data Review Team
(appears in Tables to right of vertical bar)

The following codes provide brief explantations of the cause for qualification of the data results determined in the data review process. These reason codes are used in combination with the data qualifier, i.e. "Jl" indicates the analyte was qualified as a "J" positive identification with an approximate concentration in the sample for the reason "l" that the laboratory control sample failed to meet the QA/QC recovery criteria.

Q	Other. (Not reasons i, l, or m as listed below).
i	Internal standard failure.
l	Laboratory control sample recovery failure
m	Matrix spike/matrix spike duplicate recovery failure.

TABLE D-2
BACKYARDS AREA
LNAPL ANALYTICAL DATA

Analyte	Location / Date / QA / UNITS	C4-66 08/08/96 mg/kg	D7-35 08/08/96 mg/kg
8260			
1 2-DICHLOROBENZENE	mg/Kg	<500	<100
1 3-DICHLOROBENZENE	mg/Kg	<500	<100
1 4-DICHLOROBENZENE	mg/Kg	<500	<100
BENZENE	mg/Kg	<250	<50
ETHYL BENZENE	mg/Kg	**630**	**360**
M,P-XYLENE	mg/Kg	**6000**	**850**
O-XYLENE	mg/Kg	<500 |UJ	**3800**
TOLUENE	mg/Kg	<250 |UJ	**1000**
8270			
1-METHYLNAPHTHALENE	mg/Kg	**31000**	**6100**
2-METHYLNAPHTHALENE	mg/Kg	**52000**	**4100**
ACENAPHTHENE	mg/Kg	**970** J|J	<1000
ANTHRACENE	mg/Kg	<1000	<1000
BENZO(A)ANTHRACENE	mg/Kg	<1000	<1000
BENZO(A)PYRENE	mg/Kg	<1000	<1000
BENZO(B)FLUORANTHENE	mg/Kg	<1000	<1000
BENZO(G,H,I)PERYLENE	mg/Kg	<1000	<1000
BENZO(K)FLUORANTHENE	mg/Kg	<1000	<1000
BIS(2-ETHYLHEXYL)PHTHALATE	mg/Kg	<1000	<1000
CHRYSENE	mg/Kg	**190** J|J	<1000
DIBENZ(A,H)ANTHRACENE	mg/Kg	<1000	<1000
FLUORANTHENE	mg/Kg	<1000	<1000
FLUORENE	mg/Kg	**1700**	**310** J|J
INDENO(1,2,3-CD)PYRENE	mg/Kg	<1000	<1000
NAPHTHALENE	mg/Kg	**6600**	**1300**
PHENANTHRENE	mg/Kg	**3500**	**400** J|J
PYRENE	mg/Kg	**360** J|J	<1000
METALS			
ANTIMONY	mg/Kg	<5	<5
ARSENIC	mg/Kg	**11**	<0.5 |UJ
BARIUM	mg/Kg	<0.5	<0.5
BERYLLIUM	mg/Kg	<0.5	<0.5
CADMIUM	mg/Kg	<0.5	<0.5
CHROMIUM	mg/Kg	**0.79**	<0.5
COBALT	mg/Kg	<1	<1
COPPER	mg/Kg	**0.55**	**7.9**
LEAD	mg/Kg	<4	<4
MERCURY	mg/Kg	<0.02 |UJ	<0.02 |UJ
NICKEL	mg/Kg	<2	<2
SELENIUM	mg/Kg	<10	<10
VANADIUM	mg/Kg	**1.7**	**1.2**
ZINC	mg/Kg	**2.7**	**2.5**

Refer to the end of Table D-1 for Qualifier Definitions.

TABLE D-3
RISK-BASED SCREENING LEVELS (RBSLs) FOR CHEMICALS OF POTENTIAL HUMAN HEALTH CONCERN
Backyards Area Refined CSM
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

Chemical	Groundwater RBSLs (mg/l)	Reference
Volatile Organic Compounds		
Benzene	0.0050	a
Ethylbenzene	29	c
Xylenes	10	a
Toluene	1.0	a
Semi-volatile Organic Compounds High Molecular Weight PAH's		
Benzo(a)anthracene	0.000031	c
Benzo(a)pyrene	0.00020	a
Benzo(b)fluoranthene	0.000031	c
Benzo(k)fluoranthene	0.000031	c
Benzo(g,h,i)perylene	0.000031	c, d
Chrysene	0.000031	c
Dibenz(a,h)anthracene	0.000031	c
Indeno(1,2,3-cd)pyrene	0.000031	c
Pyrene	11	c
Low Molecular Weight PAHs		
1-Methylnaphthalene	0.24	b, e
2-Methylnaphthalene	0.24	b, e
2-Chloronaphthalene	0.49	b
Acenaphthene	0.37	b
Acenaphthylene	0.37	b,f
Anthracene	1.8	b
Fluoranthene	0.37	c
Fluorene	14	c
Naphthalene	0.24	a
Phenanthrene	1.8	b, g

TABLE D-3
RISK-BASED SCREENING LEVELS (RBSLs) FOR CHEMICALS OF POTENTIAL HUMAN HEALTH CONCERN
Backyards Area Refined CSM
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

Chemical	Groundwater RBSLs (mg/l)	Reference
Other SVOCs		
Bis(2-ethylhexyl)phthalate	0.0059	c
Metals		
Arsenic[1]	0.00014	c
Chromium	0.18	b
Copper	1.4	b
Lead	0.004	a
Mercury	0.00015	c
Nickel[2]	5.6	c
Vanadium	0.26	b
Zinc	11	b

Notes:
a) HDOH RBCA GPS for Protection of Drinking Water
b) EPA PRG - Tap Water
c) Human Health AWQC - Fish Consumption
d) No RBSL available, indeno(1,2,3-cd)pyrene used as surrogate.
e) No RBSL available, naphthalene used as surrogate.
f) No RBSL available, acenaphthene used as surrogate.
g) No RBSL available, anthracene used as surrogate.

[1] Arsenic values are based on carcinogenic effects.

[2] Nickel values are based on assumption of soluble nickel salts.

Table D-4: Screening Analysis
Comparison of Human Health RBSLs to Maximum Detected Chemical Concentrations in the Backyards Area
Backyards Area Refined CSM
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

Chemical	Groundwater RBSLs (mg/l)	Free Product Maximum Detect (mg/l)	Retain as a COPHC?	Wells Nearest Ocean* Maximum Detect in Groundwater (mg/l)	Retain as a COPHC?	Dissolved Phase Maximum Detect in Groundwater (mg/l)	Retain as a COPHC?
Volatile Organic Compounds							
Benzene	0.0050	<50	yes**	<0.005	no	0.0032	no
Ethylbenzene	29	630	yes	0.0097	no	0.054	no
Xylenes	10	6,250	yes	0.131	no	0.30	no
Toluene	1.0	1,000	yes	0.012	no	0.055	no
Semi-volatile Organic Compounds							
High Molecular Weight PAHs							
Benzo(a)anthracene	0.000031	<1000	no	<0.0001	no	0.0034	yes
Benzo(a)pyrene	0.00020	<1000	no	<0.0001	no	0.0044	yes
Benzo(b)fluoranthene	0.000031	<1000	no	<0.0001	no	0.0027	yes
Benzo(k)fluoranthene	0.000031	<1000	no	<0.0001	no	<0.0001	no
Benzo(g,h,i)perylene	0.000031	<1000	no	<0.0001	no	0.0032	yes
Chrysene	0.000031	190	yes	<0.0001	no	0.009	yes
Dibenz(a,h)anthracene	0.000031	<1000	no	<0.0001	no	0.00096	yes
Indeno(1,2,3-cd)pyrene	0.000031	<1000	no	<0.0001	no	0.00084	yes
Pyrene	11	360	yes	0.00017	no	0.009	no
Low Molecular Weight PAHs							
1-Methylnaphthalene	0.24	31,000	yes	NA	no	NA	no
2-Methylnaphthalene	0.24	52,000	yes	0.015	no	0.020	no
2-Chloronaphthalene	0.49	NA	no	<0.01	no	0.0081	no
Acenaphthene	0.37	970	yes	0.0009	no	0.012	no
Acenaphthylene	0.37	NA	no	0.00026	no	0.0028	no
Anthracene	1.80	<1000	no	0.00014	no	0.0025	no
Fluoranthene	0.4	<1000	no	<0.0001	no	0.0013	no
Fluorene	14.00	1,700	yes	0.0011	no	0.0080	no
Naphthalene	0.24	6,600	yes	0.0015	no	0.46	yes
Phenanthrene	1.80	3,500	yes	0.00038	no	0.015	no
Other SVOCs							
Bis(2-ethylhexyl)phthalate	0.0059	<1000	no	0.0035	no	0.34	yes
Metals							
Arsenic[1]	0.00014	11	yes	0.0071	yes	0.16	yes
Chromium	0.18	0.79	yes	0.012	no	0.33	yes
Copper	1.4	7.9	yes	NA	no	NA	no
Lead	0.0040	<4	no	<0.002	no	0.32	yes
Mercury	0.00015	<0.02	no	0.00033	yes	0.0026	yes
Nickel[2]	5.6	<2	no	<0.012	no	0.24	no
Vanadium	0.26	1.7	yes	0.012	no	0.24	no
Zinc	11	2.7	no	NA	no	NA	no

Notes:
NA = Not Analyzed or Applicable.
*Wells along site perimeter are A3-62, B5-R08, C6-58, C6-56, C7-54, D7-51, D8-50, D8-48
**Detection limit was greater than the RBSL and chemical is a class A carcinogen. Chemical is generally associated with petroleum hydrocarbons. Therefore, chemical was conservatively retained as a COPHC even though it was not detected.
[1] Arsenic values are based on carcinogenic effects.
[2] Nickel values are based on assumption of soluble nickel salts.
Free product results assume a density of 1.0 g/cm^3 for conversion from mg/kg to mg/l

Table D-5: Risk-based Screening Levels (RBSLs) for Chemicals of Potential Ecological Concern
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

Chemical	Groundwater RBSLs (mg/l)	Reference
Volatile Organic Compounds		
Benzene	1.7	a
Ethylbenzene	0.14	a
Xylenes	10	a
Toluene	2.1	a
Semi-volatile Organic Compounds		
High Molecular Weight PAHs		
Benzo(a)anthracene	0.0002	b
Benzo(a)pyrene	0.0002	a
Benzo(b)fluoranthene	0.0002	b
Benzo(k)fluoranthene	0.0002	b
Benzo(g,h,i)perylene	0.0002	b
Chrysene	0.0002	b
Dibenz(a,h)anthracene	0.0002	b
Indeno(1,2,3-cd)pyrene	0.0002	b
Pyrene	0.0002	b
Low Molecular Weight PAHs		
1-Methylnaphthalene	0.77	c
2-Methylnaphthalene	0.77	c
2-Chloronaphthalene	0.77	c
Acenaphthene	0.32	a
Acenaphthylene	0.32	a,d
Anthracene	0.77	c
Fluoranthene	0.013	a
Fluorene	0.0039	e
Naphthalene	0.77	a
Phenanthrene	0.0083	e
Other SVOCs		
Bis(2-ethylhexyl)phthalate	0.032	e
Metals		
Arsenic	0.036	e
Chromium	0.21	f
Copper	0.0029	e
Lead	0.0056	a
Mercury	0.0011	a
Nickel	0.0082	e
Vanadium	0.019	e
Zinc	0.081	e

Notes:
NA = Not Available
(a) HDOH RBCA GPS Non-drinking Water (HDOH, 1995)
(b) No RBSL available, B(a)P used as surrogate.
(c) No RBSL available, naphthalene used as surrogate.
(d) No RBSL available, acenaphthene used as surrogate.
(e) EPA Ecotox Threshold (EPA, 1996b).
(f) EPA AWQC (1992b) for continuous exposure, freshwater species.

Table D-6: Screening Analysis
Comparison of Ecological RBSLs to Maximum Detected Chemical Concentrations
Backyards Area Refined CSM
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

Chemical	Groundwater RBSLs (mg/l)	Free Product Maximum Detect (mg/l)	Retain as a COPEC?	Wells Nearest Ocean* Maximum Detect in Groundwater (mg/l)	Retain as a COPEC?	Dissolved Phase Maximum Detect in Groundwater (mg/l)	Retain as a COPEC?
Volatile Organic Compounds							
Benzene	1.7	<50	no	<0.005	no	0.0032	no
Ethylbenzene	0.14	630	yes	0.0097	no	0.054	no
Xylenes	10	6,250	yes	0.131	no	0.300	no
Toluene	2.1	1,000	yes	0.012	no	0.055	no
Semi-volatile Organic Compounds							
High Molecular Weight PAHs							
Benzo(a)anthracene	0.0002	<1000	no	<0.0001	no	0.0034	yes
Benzo(a)pyrene	0.0002	<1000	no	<0.0001	no	0.0044	yes
Benzo(b)fluoranthene	0.0002	<1000	no	<0.0001	no	0.0027	yes
Benzo(k)fluoranthene	0.0002	<1000	no	<0.0001	no	<0.0001	no
Benzo(g,h,i)perylene	0.0002	<1000	no	<0.0001	no	0.0032	yes
Chrysene	0.0002	190	yes	<0.0001	no	0.009	yes
Dibenz(a,h)anthracene	0.0002	<1000	no	<0.0001	no	0.00096	yes
Indeno(1,2,3-cd)pyrene	0.0002	<1000	no	<0.0001	no	0.00084	yes
Pyrene	0.0002	360	yes	0.00017	no	0.009	yes
Low Molecular Weight PAHs							
1-Methylnaphthalene	0.77	31,000	yes	NA	no	NA	no
2-Methylnaphthalene	0.77	52,000	yes	0.015	no	0.020	no
2-Chloronaphthalene	0.77	NA	no	<0.01	no	0.0081	no
Acenaphthene	0.32	970	yes	0.0009	no	0.012	no
Acenaphthylene	0.32	NA	no	0.00026	no	0.0028	no
Anthracene	0.77	<1000	no	0.00014	no	0.0025	no
Fluoranthene	0.013	<1000	no	<0.0001	no	0.0013	no
Fluorene	0.0039	1,700	yes	0.0011	no	0.008	yes
Naphthalene	0.77	6,600	yes	0.0015	no	0.46	no
Phenanthrene	0.0083	3,500	yes	0.00038	no	0.015	yes
Other SVOCs							
Bis(2-ethylhexyl)phthalate	0.032	<1000	no	0.0035	no	0.340	yes
Metals							
Arsenic	0.036	11	yes	0.0071	no	0.16	yes
Chromium	0.21	0.79	yes	0.012	no	0.33	yes
Copper	0.0029	7.90	yes	NA	no	NA	no
Lead	0.0056	<4	no	<0.002	no	0.32	yes
Mercury	0.0011	<0.02	no	0.00033	no	0.0026	yes
Nickel	0.0082	<2	no	<0.012	no	0.24	yes
Vanadium	0.019	1.7	yes	0.012	no	0.24	yes
Zinc	0.081	2.7	yes	NA	no	NA	no

Notes:
*Wells along site perimeter are A3-62, B5-RO8, C6-58, C6-56, C7-54, D7-51, D8-50, D8-48
NA = Not Analyzed or Applicable.

Table D-7
Chemicals Eliminated as COPCs
Backyards Area Refined CSM
Chevron Hawaii Refinery
Kapolei, Hawaii
(Page 1 of 2)

Chemical	Retained as COPC - Human?	Basis for Exclusion	Retained as COPC- Ecological?	Basis for Exclusion
Volatile Organic Compounds				
Acetone	no	QA	no	QA
Benzene	no-D yes-L	RBSL	no-D no-L	RBSL-D ND-L
Ethylbenzene	no-D yes-L	RBSL	no-D yes-L	RBSL
Xylenes	no-D yes-L	RBSL	no-D yes-L	RBSL
Toluene	no-D yes-L	RBSL	no-D yes-L	RBSL
Semivolatile Organic Compounds - High Molecular Weight PAHs				
Pyrene	no-D yes-L	RBSL	yes	
Low Molecular Weight PAHs				
2-Methylnaphthalene	no-D yes-L	RBSL	no-D yes-L	RBSL
2-Chloronaphthalene	no	RBSL-D NA; dissolved phase below RBSL-L	no	RBSL-D NA; dissolved phase below RBSL-L
Acenaphthene	no-D yes-L	RBSL	no-D yes-L	RBSL
Acenaphthylene	no	RBSL -D; NA -L	no	RBSL -D; NA -L
Anthracene	no	RBSL-D ND-L	no	RBSL-D ND-L
Fluoranthene	no	RBSL-D ND-L	no	RBSL-D ND-L
Fluorene	no-D yes-L	RBSL	yes	

Table D-7
Chemicals Eliminated as COPCs
Backyards Area Refined CSM
Chevron Hawaii Refinery
Kapolei, Hawaii
(Page 2 of 2)

Chemical	Retained as COPC - Human?	Basis for Exclusion	Retained as COPC- Ecological?	Basis for Exclusion
Naphthalene	yes		no-D yes-L	RBSL
Phenanthrene	no-D yes-L	RBSL	yes	
Other SVOCs				
Bis(2-ethylhexyl)phthalate	yes-D no-L	ND	yes-D no-L	BDL and chemical not assoc. w/petroleum
Metals				
Copper	no-D yes-L	NA	no-D yes-L	NA
Mercury	yes-D no-L	RBSL	yes	
Nickel	no	RBSL	yes-D no-L	BDL
Vanadium	no-D yes-L	RBSL	yes	
Zinc	no	RBSL	no-D yes-L	RBSL

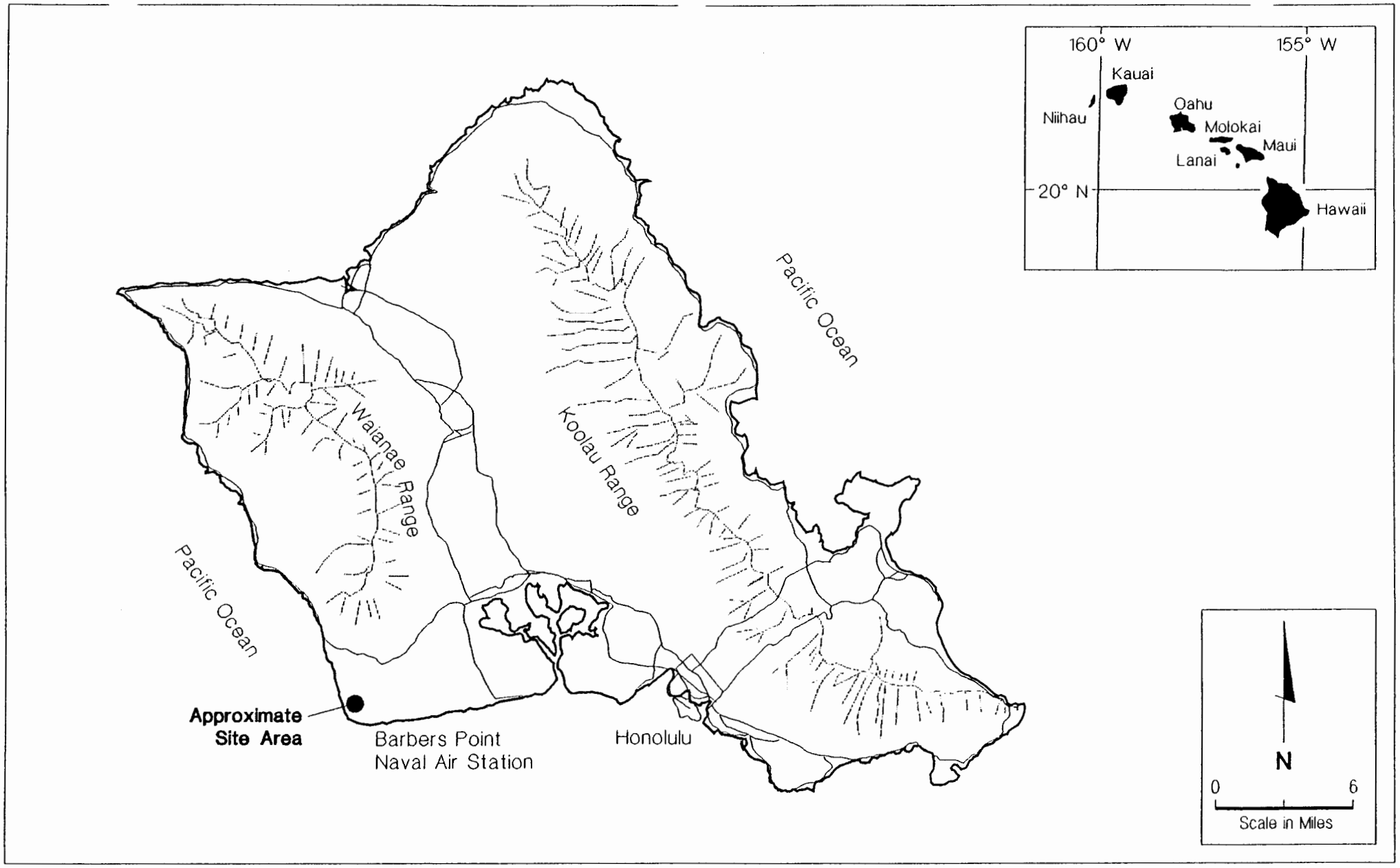
Notes:
L = LNAPL.
D = Dissolved Phase.
Unless otherwise noted, designation applies to both dissolved and LNAPL phases.

BDL = Below detection limit.
NA = Not analyzed.
ND = Not detected.
RBSL = maximum detected concentration below RBSL.
QA = Common laboratory contaminant and detected in blank.

Table D-8
Summary of Complete and Potentially Significant Exposure Pathways
Backyards Area Refined CSM
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

Exposure Medium/ Exposure Route	On-Site Workers	Off-Site Workers	Recreational User	Terrestrial Ecological	Aquatic Organisms
GROUNDWATER					
Ingestion	--	--	--	--	--
Dermal Contact	--	--	--	--	--
Vapor Inhalation					
Indoor	C-L, F-L	--	--	--	--
Outdoor	--	--	--	--	--
SURFACE WATER (OCEAN)					
Ingestion	--	--	F-D,L	--	--
Dermal Contact	--	--	F-D,L	--	--
Uptake	--	--	--	--	F-D,L
SOIL/DUST					
Incidental Ingestion	--	--	--	--	--
Dermal Contact	--	--	--	--	--
Inhalation of Particulates	--	--	--	--	--
FOOD					
Ingestion					
Fish and Shellfish	--	--	F-D,L	--	F-D,L(PR)

C = Under Current Conditions
D = Dissolved Phase
F = Under Future Conditions
L = LNAPL
PR = Predators (e.g., pelagic birds and shore birds, aquatic organisms feeding high on the food chain).



VICINITY MAP

Backyards Area Refined CSM
Chevron Hawaii Refinery
Kapolei, Hawaii

FIGURE D-1

DAMES & MOORE
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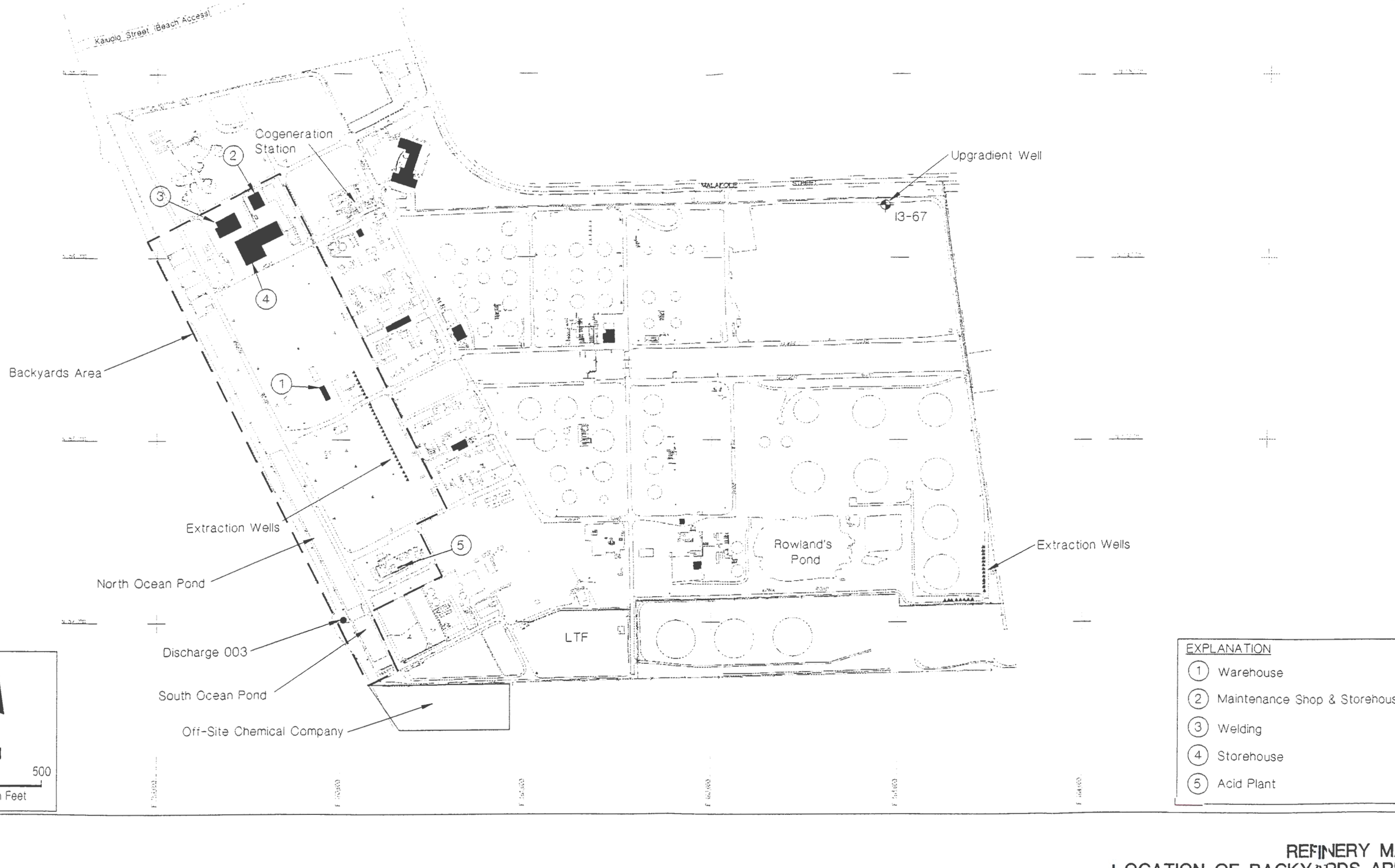

REFINERY MA
LOCATION OF BACKYARDS ARI
Backyards Area Refined C
Chevron Hawaii Refin
Kapolei, Oahu, Ha
FIGURE

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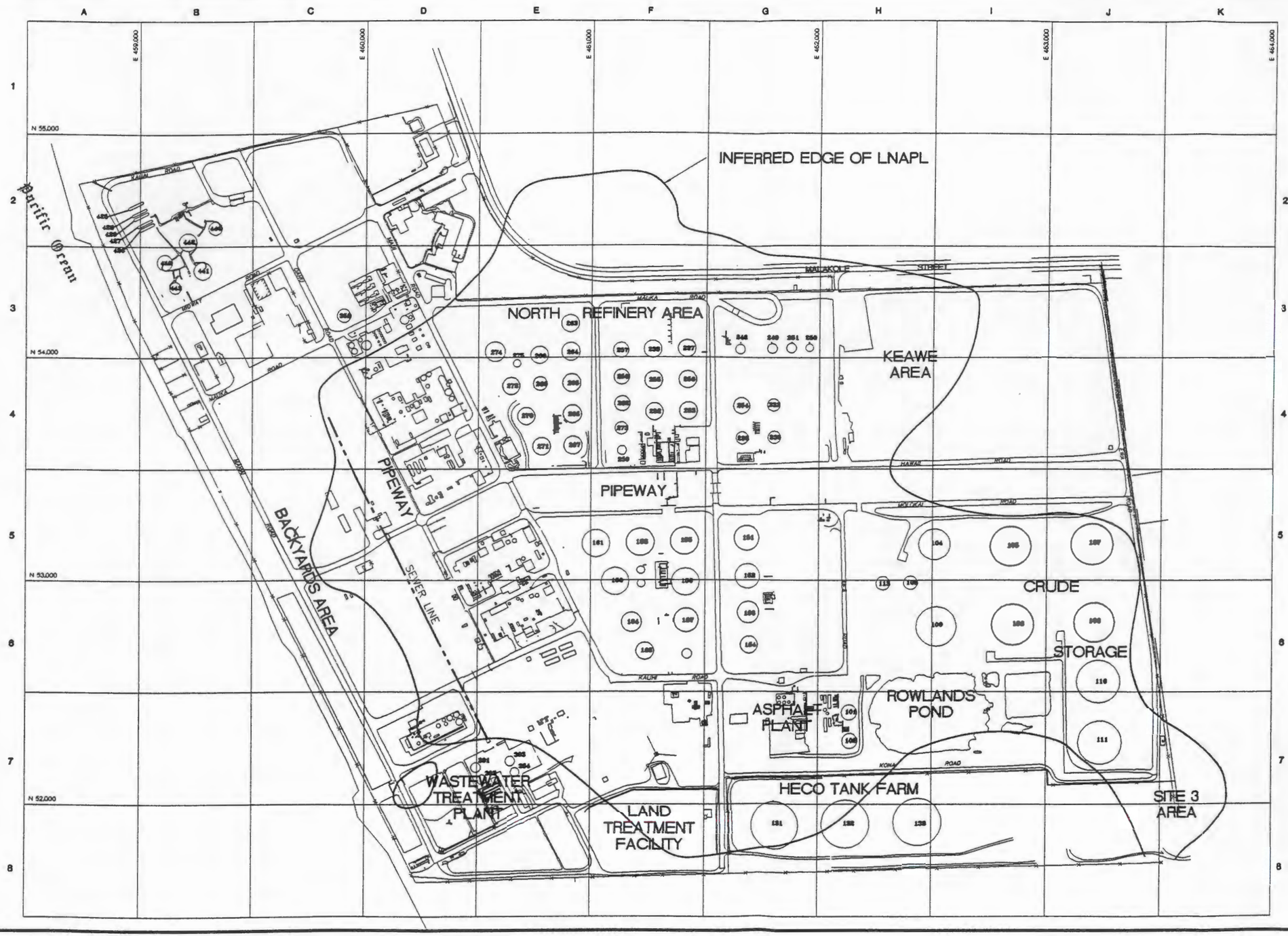

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EXTENT OF LNAPL PLU
Chevron Hawaii Refi
Kapolei, Oahu, H
FIGURE

C2-64
CROSS-GRADIENT WELL
E2-WL077
C2-P-2088
B3-P-2095A
B3-P-2095
C3-65
A3-62
NORTH PROFILE
B4-61
C4-76
E4-19
C4-66
B4-P-5219A
B4-P-5219
B4-60
C4-R09
B4-R01
INTERPRETED
EXTENT OF LNAPL
C4-RW01
D5-R46
C4-R10
E4-RW04
D5-R45
D5-R44
B5-R03
C5-R02
D5-R43
C5-59
D5-R41
D5-R40
D5-R42
D5-R39
D5-R33
D5-RW02
E5-RW05
D5-27
C5-R03
D5-R32
D5-R28
D5-R27
D5-R31
D5-R26
C5-74
D5-R30
D5-R29
D5-R25
C5-R12
C5-R11
D5-R24
C6-58
C6-R04
D6-R23
D6-R21
D6-R22
C6-R36
D6-R34
C6-R37
D6-R17
C6-57
D6-R20
D6-R16
D6-R35
D6-R15
C6-R05
D6-R19
D6-08
D6-55
D6-R18
D6-R14
D6-RW03
C6-R07
D6-R13
C6-56
CENTRAL PROFILE
C6-31
C6-R06
D6-R38
C7-54
D7-09P
D7-35
D7-P-2083
D7-P-6109
D7-53
D7-P-6109A
E7-WL078
D7-32
D7-52
D7-34
E7-20
D7-15
SOUTH PROFILE
D7-51
D7-33
E7-22
E7-16
E7-21
D8-50
D8-14
E8-45
D8-18
E8-72
D8-49
D8-17
D8-19
E8-46
D8-48
D8-47
E8-13
F8-23C

EXPLANATION
- C6-31 Existing Well
- C6-R14 LNAPL Recovery Well
- C3-65 Additional Wells to be Sampled
- C3-56 Profile Wells to be Sampled
- D8-50 Visual LNAPL Monitoring Well

N
0 200
Scale in Feet

BACKYARDS AREA MONITORING WELL PROFILES

Backyards Area Refined CSM
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

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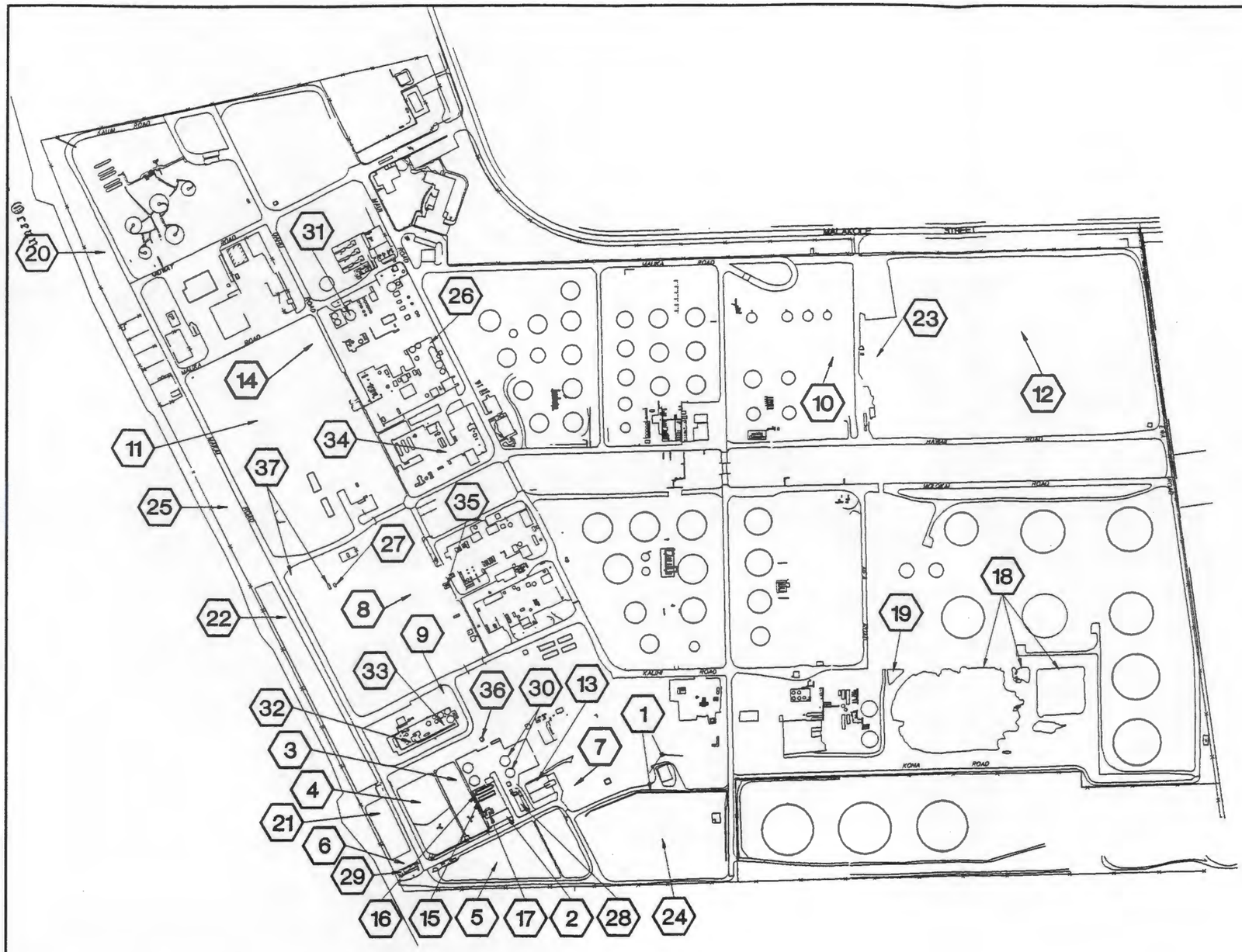
FIGURE D-4



Explanation:

1. Landfarm
2. South Surge Pond
3. Oxidation Pond #1
4. Oxidation Ponds #2, #3
5. Impounding Basin
6. IAF (Algae) Pond
7. Flare Oily Basin
8. Clay Dewatering Impoundment
9. Amine Wash Water Impoundment
10. TEL Weathering Area
11. Landfill A
12. Landfill B
13. Flare Lime Basin
14. Sewer Sludge Impoundment
15. Neutralization Pond
16. Settling Basin
17. North Surge Pond
18. Crude Tank Area Impounding Basin
19. Tank Field Storm Water Pond
20. LPG Area Cooling Water Pond
21. South Ocean Pond
22. North Ocean Pond
23. Waste Pile A
24. Waste Pile B
25. Waste Pile C
26. FCC Catalyst Fines Hoppers
27. Empty Drum Storage Area
28. API Separator
29. IAF Unit
30. Foul/Sour Water Tanks
31. Foul Water Oxidizer
32. Weak Acid Neutralization Sump
33. Strong Acid Neutralization Sump
34. Alkylation Plant Neutralization Sump
35. Clay Dewatering Basin
36. Oil Recovery Box
37. MEK/Paint Pits

Note: Locations are approximate
Some units have been closed and may no longer be present.

N

0 500

Scale in Feet

Reference:
Engineering–Science, Inc.: Report
RCRA Facility Investigation
Chevron Hawaii Refinery
Barber's Point
Oahu, Hawaii
November 1993

Solid Waste Management Units Questionnaire
Chevron U.S.A. Inc.
Hawaiian Refinery
August 5, 1985

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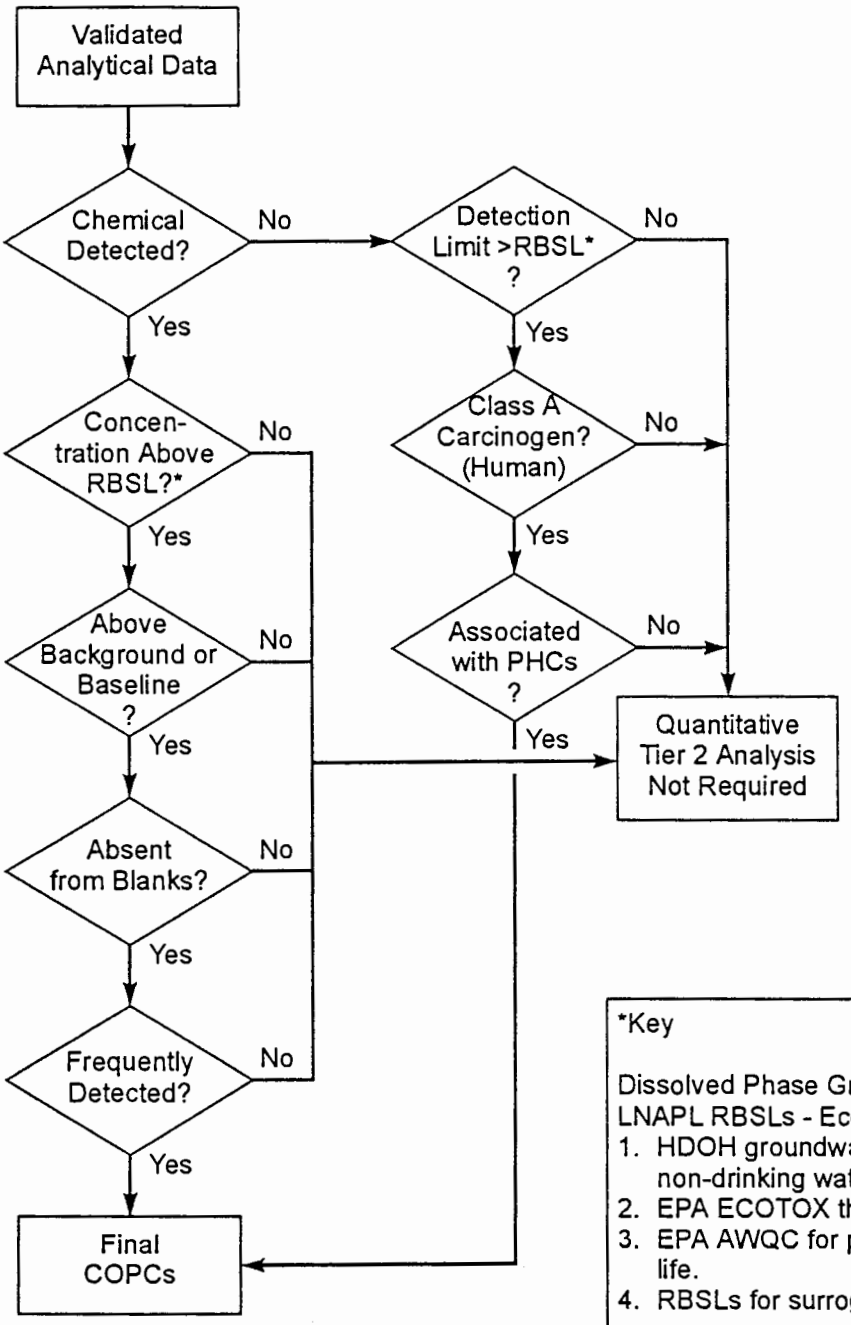
LOCATION OF RFI SO
WASTE MANAGEMENT UNI

Chevron Hawaii Refi
Kapolei, Oahu, Ha

FIGURE



*Key

Dissolved Phase Groundwater and LNAPL RBSLs - Ecological:

1. HDOH groundwater action levels - non-drinking water.
2. EPA ECOTOX thresholds.
3. EPA AWQC for protection of aquatic life.
4. RBSLs for surrogate chemicals.

Dissolved Phase Groundwater and LNAPL RBSLs - Human Health:

1. HDOH groundwater action levels.
2. Human health AWQC for fish ingestion.
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AWQC = Ambient Water Quality Criteria
COPC = Chemical of Potential Concern
HDOH = Hawaii Department of Health
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PRG = Preliminary Remedial Goal
RBSL = Risk-based Screening Level

FINAL COPC SELECTION PROCESS

Backyards Area Refined CSM
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

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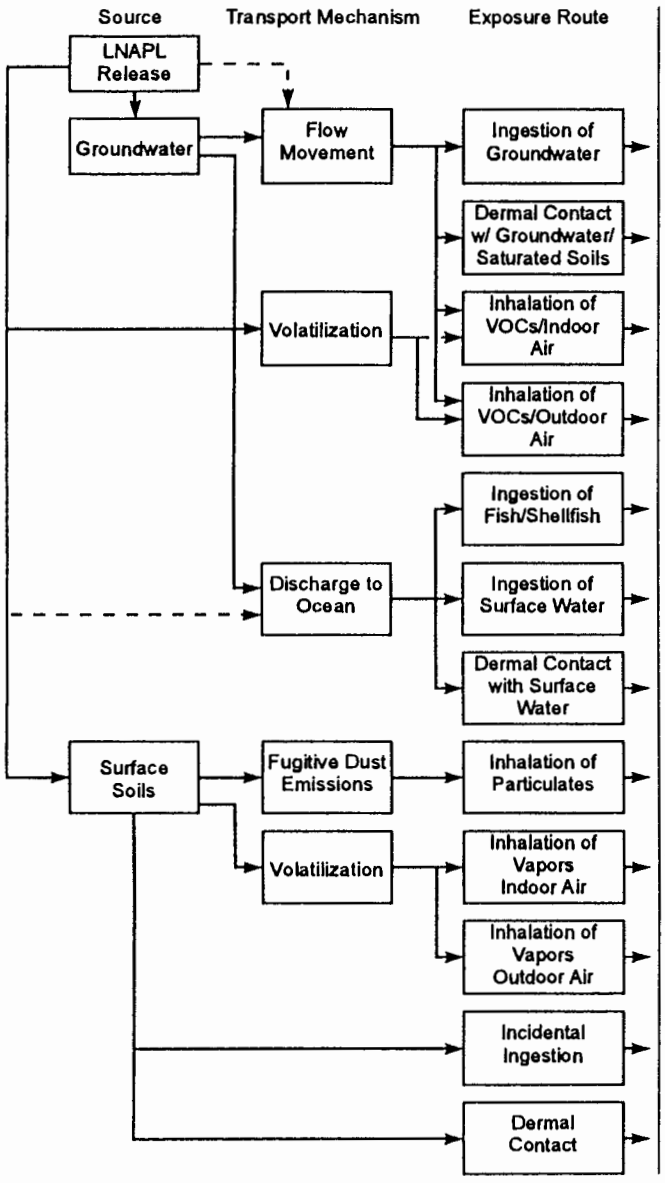
FIGURE D-6



	Current Conditions			Future Conditions			
	On-site Worker	Off-site Worker	Recreational User	On-site Worker	Off-site Worker	Construction Worker	Pacific Ocean Recreational User
Groundwater / Flow Movement / Ingestion of Groundwater	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete
Groundwater / Flow Movement / Dermal Contact w/ Groundwater/ Saturated Soils	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Complete	Incomplete
Groundwater / Volatilization / Inhalation of VOCs/Indoor Air	Insignificant	Incomplete	Incomplete	Complete	Incomplete	Incomplete	Incomplete
Groundwater / Volatilization / Inhalation of VOCs/Outdoor Air	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant
Groundwater / Discharge to Ocean / Ingestion of Fish/Shellfish	Incomplete	Incomplete	Incomplete (L) Insignificant (D)	Incomplete	Incomplete	Incomplete	Complete* (L,D)
Groundwater / Discharge to Ocean / Ingestion of Surface Water	Incomplete	Incomplete	Incomplete (L) Insignificant (D)	Incomplete	Incomplete	Incomplete	Complete* (L,D)
Groundwater / Discharge to Ocean / Dermal Contact with Surface Water	Incomplete	Incomplete	Incomplete (L) Insignificant (D)	Incomplete	Incomplete	Incomplete	Complete* (L,D)
Surface Soils / Fugitive Dust Emissions / Inhalation of Particulates	Incomplete	Incomplete	Incomplete	Insignificant	Incomplete	Complete	Incomplete
Surface Soils / Volatilization / Inhalation of Vapors Indoor Air	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete
Surface Soils / Volatilization / Inhalation of Vapors Outdoor Air	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant
Surface Soils / Incidental Ingestion	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Complete	Incomplete
Surface Soils / Dermal Contact	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Complete	Incomplete

NOTES

- — — — Hypothetical transport; Plume appears stable.
- * Contingent upon migration of plume.
- (L) = LNAPL Phase
- (D) = Dissolved Phase

"Insignificant" refers to complete exposure pathways that are not expected to significantly contribute to overall site risks.

CONCEPTUAL SITE MODEL FOR HUMAN RECEPTORS

Backyards Area Refined CSM
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

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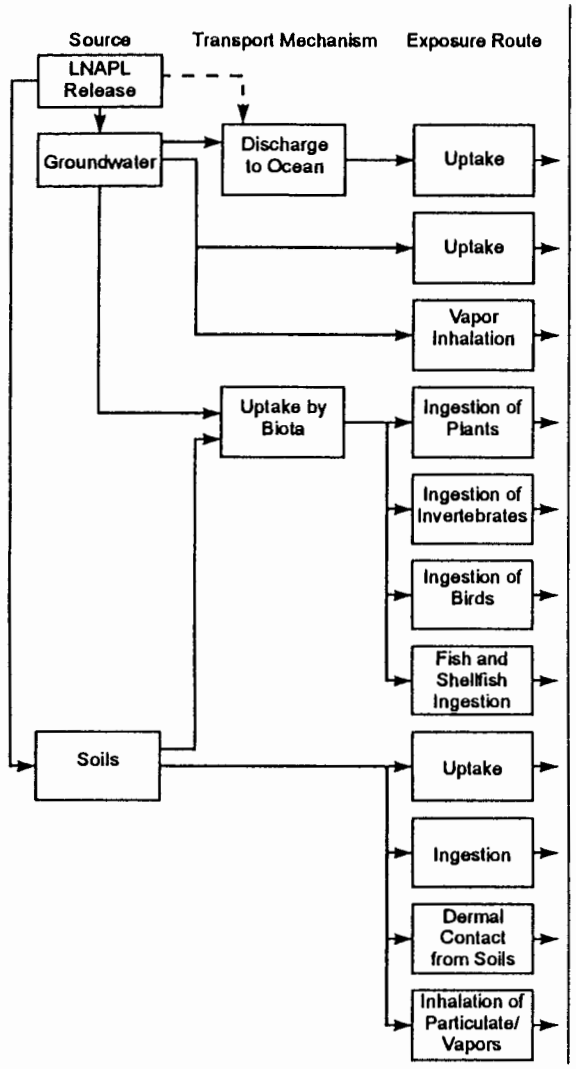
FIGURE D-7



	Current Conditions				Future Conditions			
	Aquatic Organisms	Terrestrial Plants	Terrestrial Birds	Terrestrial Mammals[1]	Aquatic Organisms	Terrestrial Plants	Terrestrial Birds	Terrestrial Mammals[1]
Groundwater → Discharge to Ocean → Uptake	Incomplete (L) Insignificant (D)	Incomplete	-	-	Complete(L)* Insignificant(D)	-	-	-
Groundwater → Uptake	Incomplete	Incomplete	-	-	Insignificant(D)	Insignificant	-	-
Groundwater → Vapor Inhalation	-	-	Insignificant	Insignificant	-	-	Insignificant	Insignificant
Groundwater → Uptake by Biota → Ingestion of Plants	Incomplete	-	Incomplete	Incomplete	Complete(L)* Insignificant(D)	-	Insignificant	Incomplete
Groundwater → Uptake by Biota → Ingestion of Invertebrates	Incomplete	-	Insignificant	Insignificant	Complete(L)* Insignificant(D)	-	Insignificant	Incomplete
Groundwater → Uptake by Biota → Ingestion of Birds	-	-	Incomplete	Insignificant	-	-	Insignificant	Insignificant
Groundwater → Uptake by Biota → Fish and Shellfish Ingestion	Incomplete	-	Incomplete	Incomplete	Complete(L,D)*(Pr)	-	Insignificant(D)	Incomplete
Soils → Uptake	-	Incomplete	-	-	-	Insignificant	-	-
Soils → Ingestion	-	-	Insignificant	Insignificant	-	-	Insignificant	Insignificant
Soils → Dermal Contact from Soils	-	-	Insignificant	Insignificant	-	-	Insignificant	Insignificant
Soils → Inhalation of Particulate/ Vapors	-	-	Insignificant	Insignificant	-	-	Insignificant	Insignificant

NOTES

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(1) Mongoose is the only mammalian wildlife.

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CONCEPTUAL SITE MODEL FOR ECOLOGICAL RECEPTORS

Backyards Area Refined CSM
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

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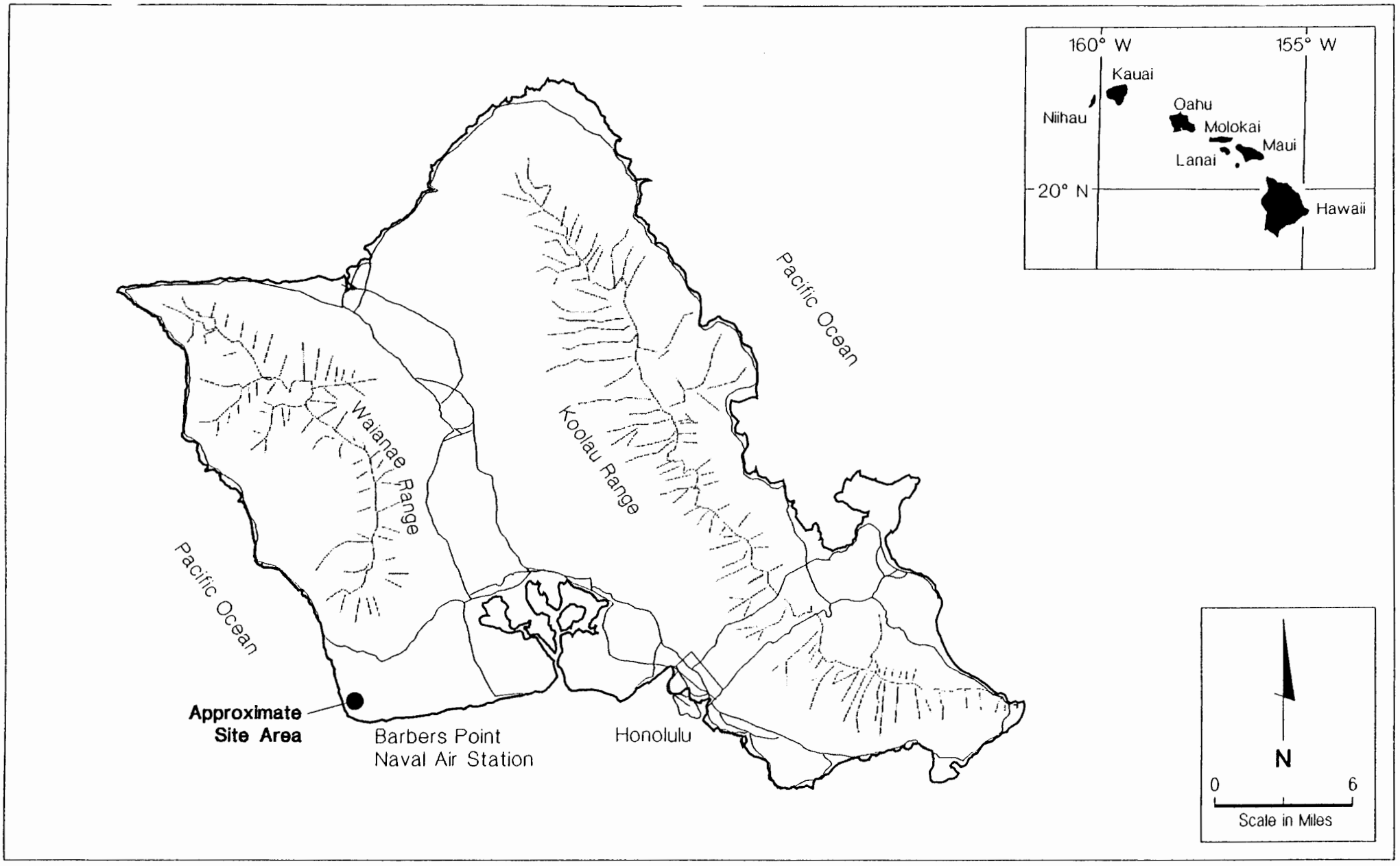
FIGURE D-8



VICINITY MAP

Backyards Area Refined CSM
Chevron Hawaii Refinery
Kapolei, Hawaii

FIGURE D-1

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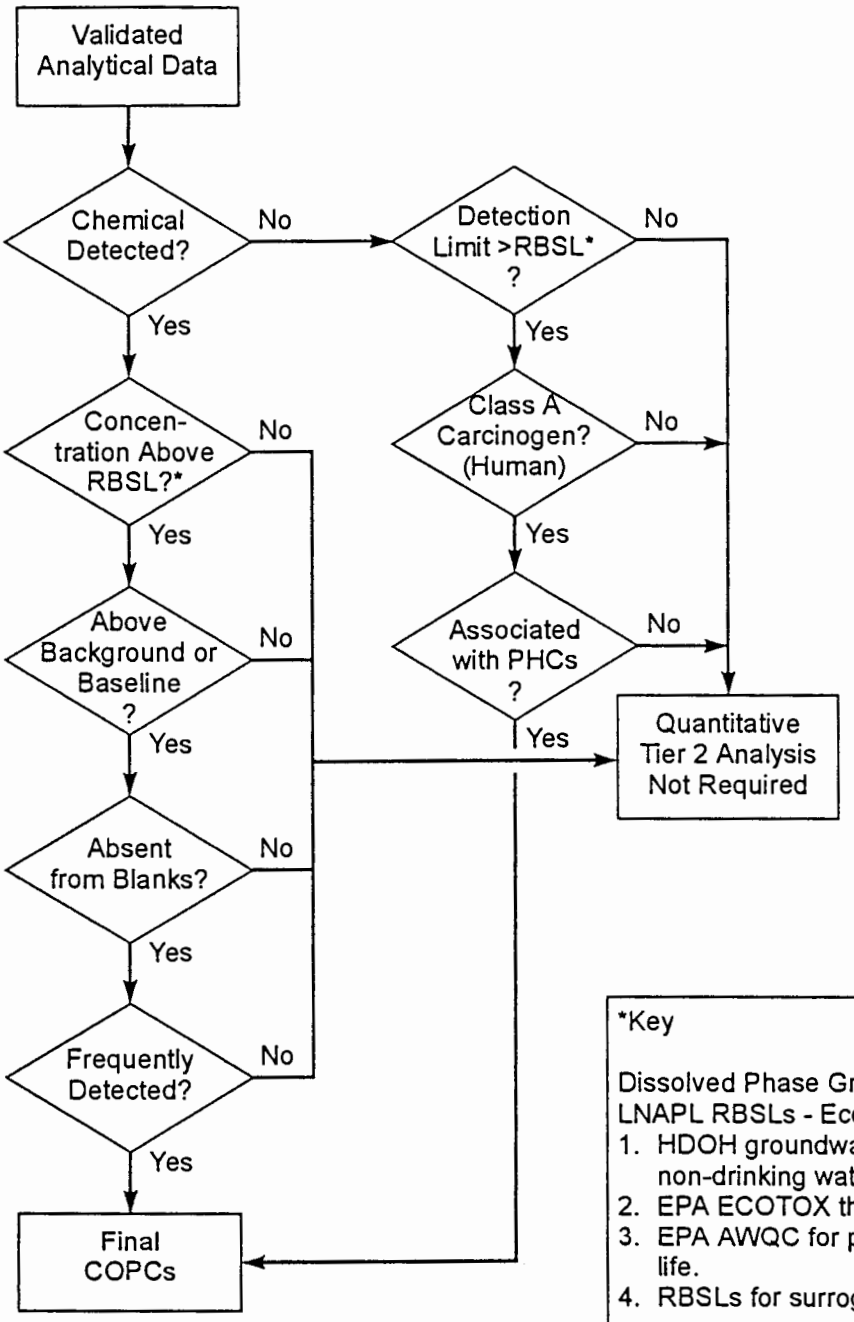

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FINAL COPC SELECTION PROCESS

Backyards Area Refined CSM
Chevron Hawaii Refinery
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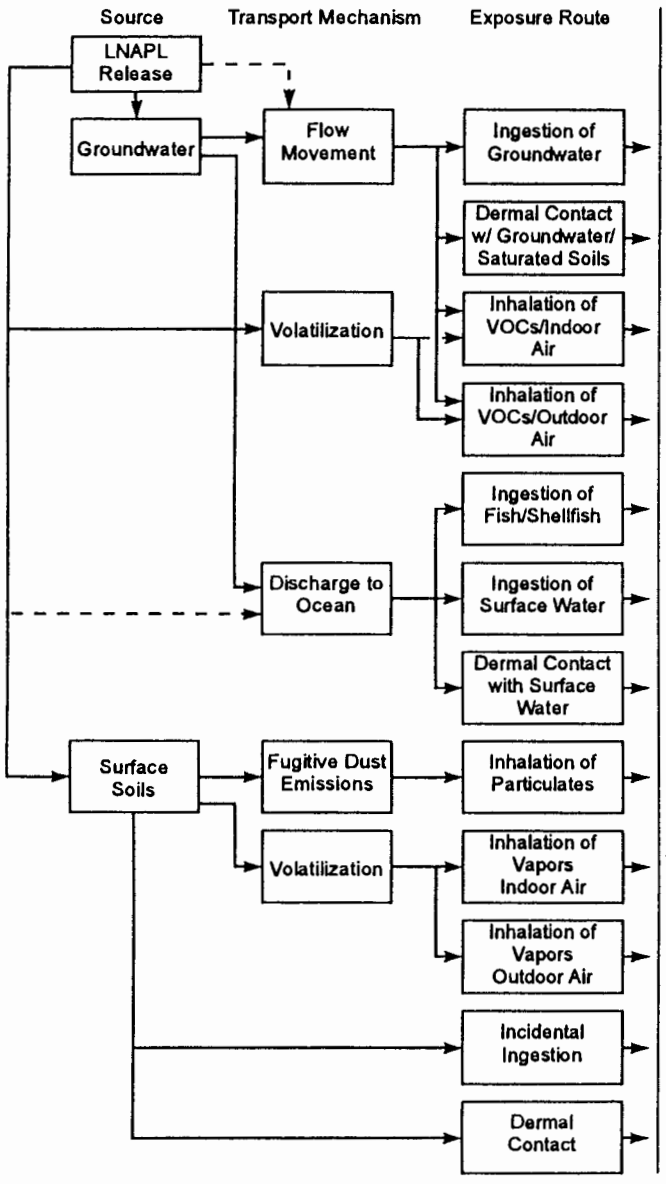
FIGURE D-6



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Ingestion of Fish/Shellfish	Incomplete	Incomplete	Incomplete (L) Insignificant (D)	Incomplete	Incomplete	Incomplete	Complete* (L,D)
Ingestion of Surface Water	Incomplete	Incomplete	Incomplete (L) Insignificant (D)	Incomplete	Incomplete	Incomplete	Complete* (L,D)
Dermal Contact with Surface Water	Incomplete	Incomplete	Incomplete (L) Insignificant (D)	Incomplete	Incomplete	Incomplete	Complete* (L,D)
Inhalation of Particulates	Incomplete	Incomplete	Incomplete	Insignificant	Incomplete	Complete	Incomplete
Inhalation of Vapors Indoor Air	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete
Inhalation of Vapors Outdoor Air	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant
Incidental Ingestion	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Complete	Incomplete
Dermal Contact	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Complete	Incomplete

NOTES

- — — Hypothetical transport; Plume appears stable.
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CONCEPTUAL SITE MODEL FOR HUMAN RECEPTORS

Backyards Area Refined CSM
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

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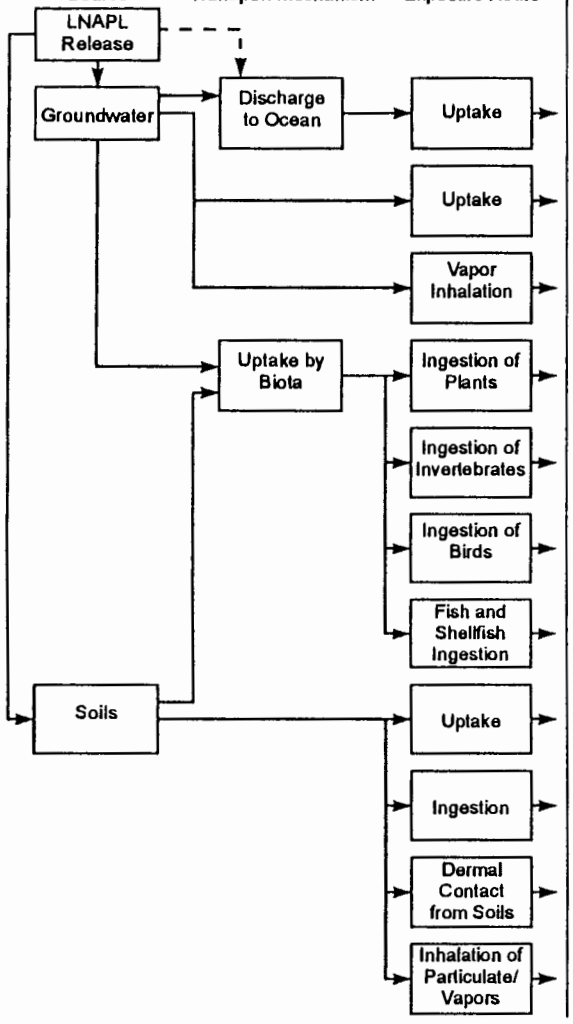
FIGURE D-7



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Groundwater → Uptake by Biota → Ingestion of Invertebrates	Incomplete	-	Insignificant	Insignificant	Complete(L)* Insignificant(D)	-	Insignificant	Incomplete
Groundwater → Uptake by Biota → Ingestion of Birds	-	-	Incomplete	Insignificant	-	-	Insignificant	Insignificant
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Soils → Ingestion	-	-	Insignificant	Insignificant	-	-	Insignificant	Insignificant
Soils → Dermal Contact from Soils	-	-	Insignificant	Insignificant	-	-	Insignificant	Insignificant
Soils → Inhalation of Particulate/ Vapors	-	-	Insignificant	Insignificant	-	-	Insignificant	Insignificant

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CONCEPTUAL SITE MODEL FOR ECOLOGICAL RECEPTORS

Backyards Area Refined CSM
Chevron Hawaii Refinery
Kapolei, Oahu, Hawaii

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FIGURE D-8